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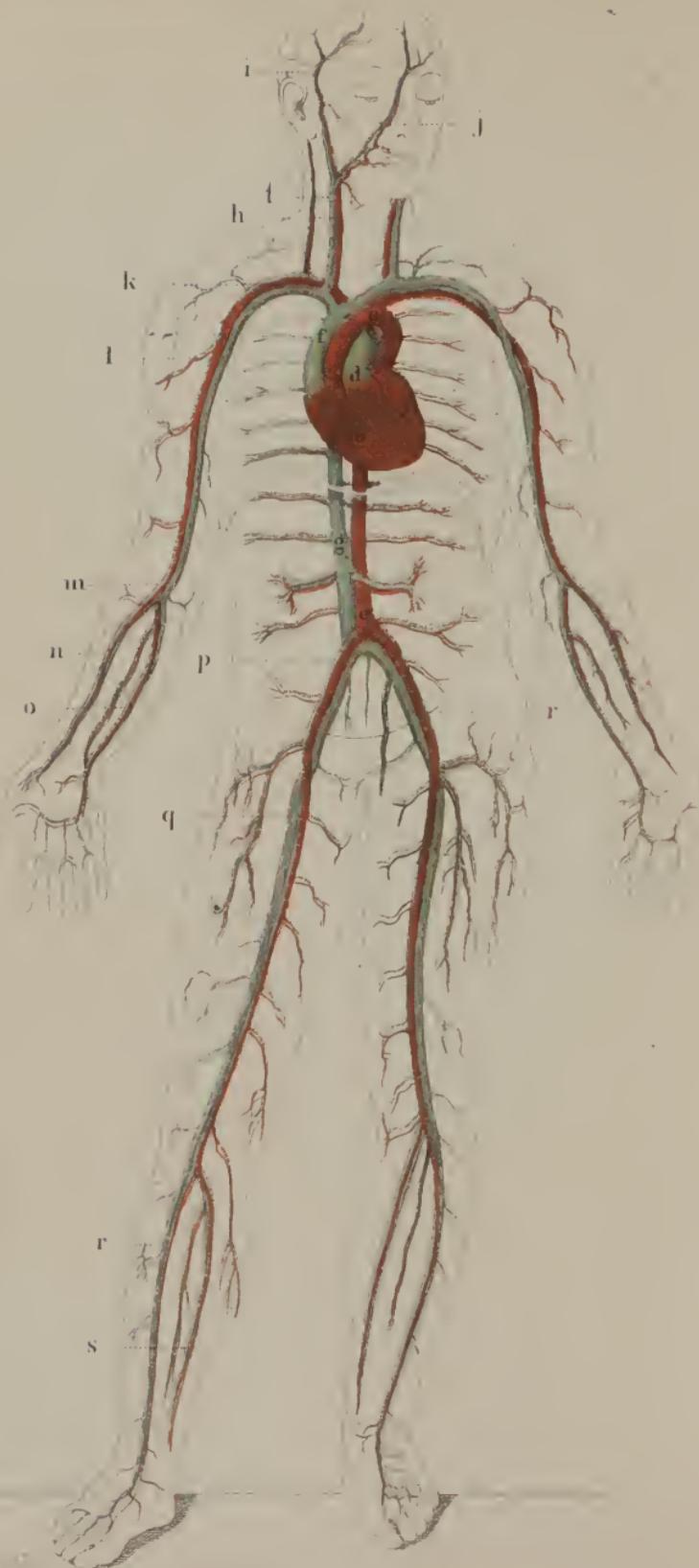


PLATE I.

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SYSTEMIC CIRCULATION.

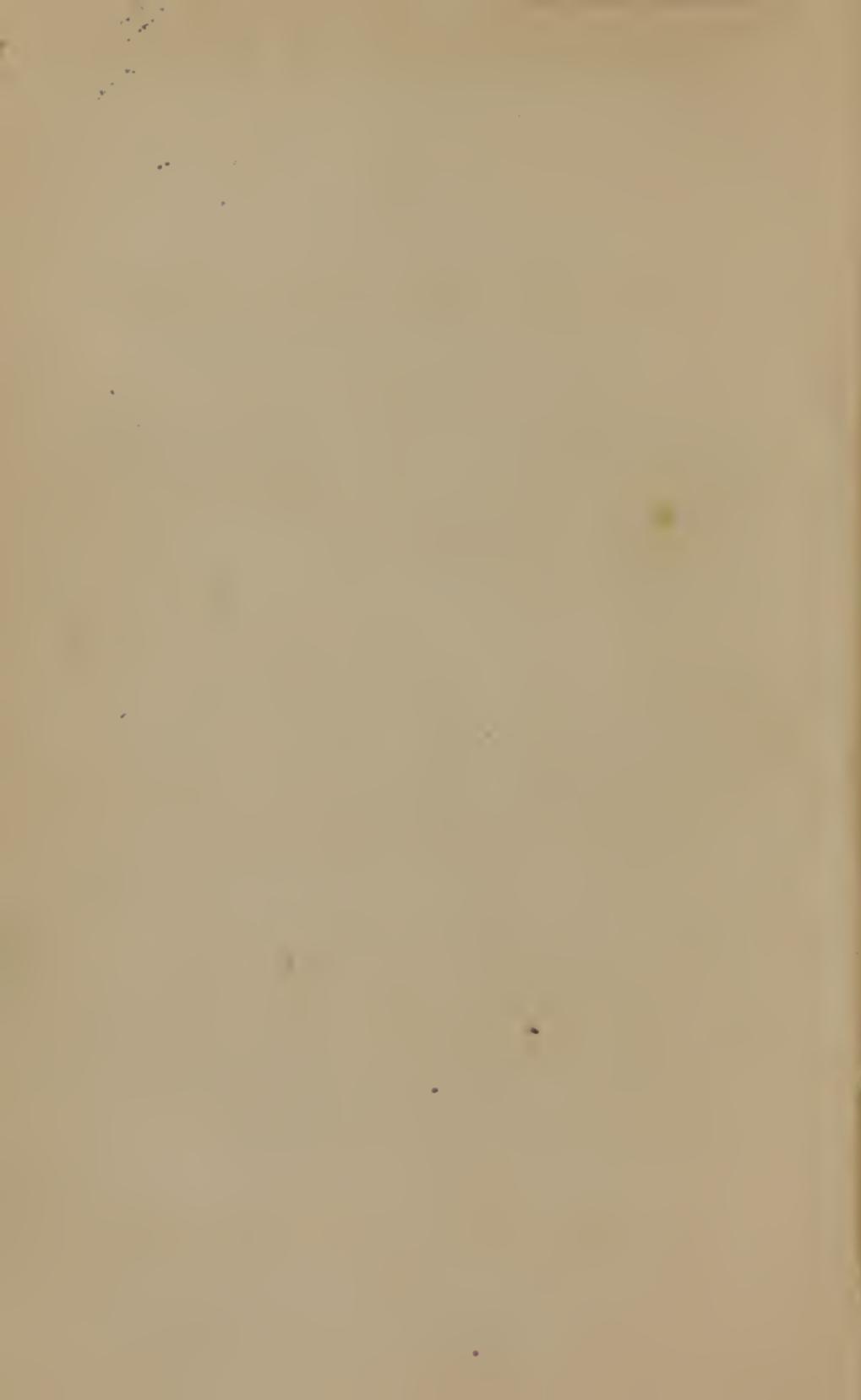
THIS figure represents the course and relative positions of the principal arteries and veins of the *systemic* or general circulation. The arteries are colored red in the figure, and have their origin from the great arterial trunk, called the *aorta*, which has its origin from the left ventricle of the heart. The arteries which arise from the aorta and from the large branches given off by it, become more and more numerous as they recede from the center of the circulation, till they finally terminate in a net-work of *capillary* or hair-like vessels.

The veins, which are colored blue in the figure, take their origin from the minute capillary terminations of the arteries, and finally converge together into two large veins, called the *superior* and the *inferior vena cava*, both of which empty into the right auricle of the heart.

The heart in man has four cavities—two auricles or receptacles and two ventricles or propelling organs. If the heart be divided vertically, each half will contain an auricle and a ventricle, which are separated from each other by membranous valves.

a, The right auricle of the heart. *b*, The right ventricle. *c*, The left ventricle. *d*, The root of the pulmonary artery. *e, e*, The aorta, which is seen arching backward over the heart, and passing downward into the abdomen, where it divides into two large branches, the iliac arteries, through which the blood passes to the lower extremities. *f*, The superior vena cava. *g*, The inferior vena cava. *h*, The carotid artery, which ascends in the side of the neck, and divides into the temporal artery, *i*, which is distributed in the temple and the facial artery, *j*, which supplies the face. *k*, The sub-clavian artery, lying beneath the clavicle or collar-bone. *l*, The axillary artery. *m*, The brachial artery. *n*, The radial artery. *o*, The ulnar artery. *p*, The iliac artery, which on passing into the thigh becomes the femoral artery, *q*, and in the leg divides into the tibial and peroneal arteries, *r, s*, which form numerous branches for the supply of the leg and foot.

The veins generally accompany the arteries in their distribution, as shown in the figure, and are often called by the same names. The principal divisions of the superior vena cava are: the jugular vein, which accompanies the carotid artery, and the sub-clavian vein, which accompanies the artery of the same name, and receives blood from the arm and hand. The inferior vena cava, like the aorta, divides into two great branches the iliac veins, the sub-divisions of which accompany those of the arteries, and are called by the same names. The manner in which the superficial veins ramify and anastomose with each other is shown on the upper and lower extremity of the left side.



PRESERVATION OF HEALTH,

✓

AND

PREVENTION OF DISEASE:

INCLUDING

PRACTICAL SUGGESTIONS ON DIET, MENTAL DEVELOPMENT,
EXERCISE, VENTILATION, BATHING, USE OF MEDICINES,
MANAGEMENT OF THE SICK, ETC.

John Bent's Office
LITERARY.
BY
B. N. COMINGS, M. D.,

AUTHOR OF "PRINCIPLES OF PHYSIOLOGY," "CLASS-BOOK OF PHYSIOLOGY," ETC.,
AND PROFESSOR OF PHYSIOLOGY, CHEMISTRY, AND NATURAL HISTORY
IN THE CONNECTICUT STATE NORMAL SCHOOL.

IF THOU WELL OBSERVE
THE RULE OF *NOT TOO MUCH*, BY TEMPERANCE TAUGHT,
IN WHAT THOU EAT'ST AND DRINK'ST, SEEKING FROM THENCE
DUE NOURISHMENT, NOT GLUTTONOUS DELIGHT,
TILL MANY YEARS OVER THY HEAD RETURN:
SO MAY'ST THOU LIVE, TILL LIKE RIPE FRUIT THOU DROP
INTO THY MOTHER'S LAP.—*Milton.*

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P R E F A C E.

WHEN life is in danger, nothing can engage our attention so much, or induce us to make so great sacrifices, or cause us to put forth such extraordinary powers, as the desire to preserve it; and in the moment of peril, we watch with the most intense earnestness every event which can possibly have any influence on its duration. If disease commences its fearful ravages on ourselves or our friends, we leave no means untried which skill or science can suggest to stay its progress. Health is therefore a possession of great value to all; though there is probably no subject pertaining to human welfare, in reference to which the mass of mankind possess so little intelligence as the art of preserving health.

Those habits of life and those causes which are perpetually inducing disease, and hurrying off to a premature grave a great majority of our race, are but little known, and but seldom heeded. According to the most reliable statistics of mortality, not more than six per cent. of all that are born, reach the period of sixty years; one-half die before the tenth year, and, in some of the cities of this country, before the sixth. Of the ninety-four hundredths who are cut off before the period of sixty, not less than nine-tenths die from causes which might have been avoided.

During the entire period of its existence, the human body is governed by laws as unalterable as the Decalogue. But, unlike the moral code, the laws which are engraven on the bones and muscles, and on the tissues and organs of the body, know of no atonement. The transgressor is usually overtaken too late to be saved by repentance. He that has violated the laws of his being by undue exposure to heat or cold, by improper indulgence of the passions or the appetite, or by excessive mental or bodily labor, must bear the consequences of his wrong-doing in his own person. Every individual is thus the divinely-appointed guardian of his own health, and is accountable for the fidelity with which he discharges his trust. A knowledge of the conditions on which the blessings of life and health are entrusted to us is, therefore, one of the most important objects that can possibly claim our attention.

In offering the following pages to the public, the author has labored to present a practical and common-sense view of the causes of disease, with the means of avoiding it, and to suggest those practices and habits of life which, if adopted, will invariably tend to secure permanent and vigorous health.

The author is under obligations to the publishers of the "*Principles of Physiology*" for permission to use such portions of the chapter on "Preservation of Health" as he has found suited to his purpose.

B. N. C.

NEW BRITAIN, MAY, 1854.

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PRESERVATION OF HEALTH.

CHAPTER I.

INTRODUCTORY OBSERVATIONS.

ALL animals are characterized during the natural period of their existence by an uninterrupted series of changes. Each organ and tissue is constantly undergoing some transition of its elements, or performing some action. The body is thus continually undergoing the process of organization or decomposition. The materials which enter the system for its formation, after securing that purpose for a brief period, yield their places to others of the same kind, and are then ejected from the system as waste matter. Each atom that composes the tissues, may be said to have an individual existence, to perform in its time a specific office, and then give place to another, destined to the same course of life and death. The activity of these life-giving changes varies exceedingly at different periods of life and in different tissues at the same period. In children, the processes of organization and decomposition are much more active than in the adult, and are less active in the aged than either. In like manner those tissues which are the most constantly brought into action in the phenomena of life, are subject to the most frequent changes. Thus, these vital processes are carried on with much greater energy in the muscular and nervous systems than in the bones and the more solid or more passive parts. In health, the supply of the nutritive, and the waste of the worn-out materials are about equal, except in the growing state, when the supply greatly exceeds the waste.

Health, which is the natural condition of all animals

during the appointed period of their existenee, is enjoyed very much in proportion to the exemption of those causes that diminish the activity of the nutritive proceess or exhaust the vital energies. The constant exereise of the physical and intelleetual powers in man, together with the infinite variety of his habits, are constantly disturbing the equilibrium of the vital changes, and rendering him liable to disease. In other animals, which are guided by instinct to more uniform habits of life, and which are exempt from intelleetual passions and emotions, the duration of life, and the uninterrupted enjoyment of health is much more uniform than in man; for it cannot be denied that those animals whieh follow the impulses of instinct enjoy more uniformity of health, with a more perfect exemption from disease, pain, and suffering; and the duration of life to a given period, characteristic of each group, is correspondingly more certain to each individual. The great mass of mankind can hardly be said to be guided in those habits which more particularly affect health either by instinct or reason, since they are wholly ignorant of the laws of their being, and of the causes that impair health and shorten life, and therefore cannot be said to exercise their reason in the matter. But whenever individuals, or families, or communities, have possessed sufficient knowledge of their own organization to exereise any tolerable degree of intelligence in regard to the means of avoiding disease and promoting health, the average duration of life, as well as the uniform enjoyment of health, has very much increased.

The natural period of man's life has been estimated at seventy years, and this is perhaps near the true estimate, since almost all who die previous to that age, are the victims of violence or disease. But the average duration of human life is only about one-half this period in those countries most favorable to longevity, while it is much shorter in those localities most unfavorable to health. "In Geneva, where there has been a full registration of

all the deaths for several centuries, it appears that in the sixteenth century one-half of all that were born, died under five years of age, and the average longevity of the whole population, was but thirteen years. In the seventeenth century only one-half died under twelve. But in the first sixty years of the eighteenth century, one-half of the population lived over twenty-seven years. In the latter forty years, one-half exceeded thirty-two years of age. At the beginning of the present century, one-half exceeded forty years, and from 1838 to 1845, one-half exceeded forty-three years. Thus, the duration of life in that city has increased from eighteen to forty-three years"—an improvement which would make a variation in the bills of mortality in the United States of more than half a million, or about fifteen hundred deaths daily.

In the island of St. Kilda, the most northern of the Hebrides, eight out of every twelve children die between the eighth and twelfth day of their existence; and the population of the island is diminishing rather than increasing. This is due to the filth in which the inhabitants live, and the noxious effluvia which pervade their apartments. During the space of twenty-one years, ending in the year 1796, in the Dublin Foundling Hospital, out of ten thousand two hundred and seventy-two sick children sent to the infirmary, only forty-five recovered. The cause of this most fearful mortality was deficient ventilation and improper food, with most criminal treatment on the part of the nurses. The children were fed by hand, and when they cried and became troublesome, they were dosed with laudanum, to keep them still—a result which it perfectly effected, for many of them never awoke. In another similar institution in Dublin, at the conclusion of the year 1782, out of seventeen thousand six hundred and fifty infants, two thousand nine hundred and forty-four, or nearly every sixth child, died within a fortnight after its reception. By improved ventilation of the wards, the mortality was speedily reduced to one in nineteen and one-half, instead

of one in six. In London, during successive periods of twenty years, the following reduction of the average numbers of deaths among children under five years of age were made by increased attention to the physiological conditions requisite for health; in twenty years, from 1730 to 1750, out of every one hundred children born, seventy-four, or nearly three out of four, died before they were five years old. In the next twenty years, the number was reduced to sixty-three in one hundred, or less than two-thirds. Between 1770 and 1790, it was only fifty-one in one hundred, or little more than one-half. From 1790 to 1810, it was further reduced to forty-one in one hundred, or little more than two-fifths. And between 1810 and 1830, it was no more than thirty-two in one hundred, or less than one-third.

Attention to the laws of life proves efficacious not only in diminishing mortality, but in promoting health. A remarkable case in point, is that of the Orphan Asylum in Albany, New York, which was opened at the end of 1829, with about seventy children, which number was subsequently increased to eighty. "During the first three years, when an imperfect mode of management was in operation, from four to six children were constantly on the sick-list; the physician was in regular attendance twice or thrice a week; and the deaths, for the three years, amounted to between thirty and forty, or about one in every month. At the end of this time, an improved system of management and diet was adopted. The sick-room was entirely vacated, and the services of a physician no longer needed, and for more than two years no case of sickness or death took place. It is also true that, since the new regimen has been fully adopted, there has been a remarkable increase of health, strength, activity, vivacity, cheerfulness, and contentment, among the children. The change of temper is also very great; they have become less turbulent, irritable, peevish, and discontented, and far more gentle and kind to each other.

Every improvement that has taken place in regard to the physical condition of both infants and adults has been attended by a corresponding increase in the duration of life. Historical facts abundantly prove that the term of human life has undergone an increase since the last century. Tables, computed as the basis of life insurance seventy or eighty years ago, are found to have underrated the present duration of life very considerably. But the abodes of squalid poverty are still marked by a fearful mortality of the inmates; showing that filth, destitution, and wretchedness, court diseases. In France, the number of deaths among the poor is more than twice as great, in proportion to the whole number, as among those in easy circumstances. In England and Scotland, no more than one in fifty-eight, out of the whole population, now die every year; while, in Germany, the average is one in forty-five; in France, one in thirty-nine; in Turkey, one in thirty; in the Roman States, one in twenty-eight. In Franklin county, the most favorable to longevity of all the counties of Massachusetts, the average duration of life is about thirty-nine years; in the city of Boston, it is a little less than twenty-two and three-quarter years. Among foreigners, who constitute the poorest class in Boston, the average duration of life is only thirteen five-tenth years, or about one-third the average in Franklin county. Statistical facts are not wanting to prove that the scale of human life every where rises or falls with the physical condition of the people. The intelligent physician, as he goes the round of his daily calls in all grades of families, is constantly reminded of the contrast in health and happiness between those who observe an intelligent obedience to the rules of health, and those who live in careless ignorance of the laws of their own being, and are regardless of personal filth and exposure. For nothing is more certain than that communities are healthy and long-lived just in proportion as their localities, occupations, and habits of life are favorable to those conditions.

Self-preservation, in view of immediate danger, is one of the most active and strongest impulses of our nature. And yet it is equally true, that the penalties of violating physical laws are usually so remote, that the great mass live without any thought or apparent regard of the means of preserving life. If every violation of the laws of our organization was followed by an immediate pain or ache, or by sickness and death, we should very soon come to feel the true importance of a thorough knowledge of all those branches of study which acquaint us with our wants, capacities, and structure. We are endowed with life, and permitted its enjoyment for a longer or shorter period, according to the obedience we render to those laws which are written on the bones, muscles, nerves, and tissues of our bodies. Every individual is, by Divine appointment, the guardian of his own health, and is therefore personally responsible for the fidelity and intelligence with which he guards this most important trust.

CHAPTER II.

CAUSES OF DISEASE.

IT is not possible, in the space proper to allot to this subject, to give any thing like a full account of the causes that operate to impair health, and bring on disease and death. Many are of a general character, that exhaust and enfeeble the vital powers, and render the system susceptible of disease. Others are the direct result of the indulgence of the appetite and passions, of improper exposure to sudden changes of temperature, or of excessive mental and bodily fatigue. In various ways millions of our race perish annually from a neglect of those conditions which Divine Wisdom has appointed as a requisite for the preservation of the body from fatal disease, and millions more are constantly suffering pain and weakness that might

have been avoided by attention to those principles which it is the province of Physiology to unfold.

By the impulses of instinct, the animals are led to adopt those habits of life and those localities most favorable to their own individual organization. The same All-wise Being who created them, has taught each the kind of diet to maintain life: each zone has animals peculiar to itself, and each animal is fitted by peculiarities of structure for a particular kind of diet, upon which it invariably subsists. The ox and horse live only on herbage, grasses, grain, &c., and the lion and tiger on the flesh of other animals. Insects, whose period of life for the most part is very brief, subsist in a great variety of ways; but each species has a kind of food peculiar to itself. Man is the only animal that inhabits all climates, and possesses the power of changing his residence from one climate to another with impunity. He also enjoys a wider range of diet than any other; and is endowed with reason, and the faculty of learning by experience, to enable him to pursue those habits best adapted to promote health in the various localities he may inhabit. His food, for the most part, undergoes a process of cooking, to render it more easy of digestion. His clothing is prepared by his own hands, according to the climate to which he may be exposed. His early years, however, are characterized by entire dependence upon the condition in which he is placed for the future development of his frame; and it depends, in great part, upon the care with which he is tended, and the knowledge by which that care is guided, whether he shall grow up in health, and vigor of body and mind, or become weakly, and fall the victim of premature disease and death. Thus, man's system of life is almost wholly artificial, and his habits are varied, according to the knowledge and inclinations of each. In the supply of warmth, food, and air to the body, the greatest essentials to life, no uniformity prevails. The protection of the body, its nutriment, and its exercise, are all artificial. Nor is his diet

restricted to the natural productions of the locality he may inhabit. Commeree brings to him the luxuries of all climates, and makes his table to groan under the burden of an unlimited variety that creates and pampers an artificial appetite. The fashions and customs of society are thus based on artificial systems of diet, dress, sleep, and labor; all tending to make the possession of health and the duration of life variable and uncertain. This will be seen, by comparing the tables of mortality in different localities, and in different classes of society in the same localities.

Improper management in regard to warmth, food, and air, causes a vast amount of suffering and disease that might be avoided by proper attention to these three great essentials of life. Among all the fashionable circles of society, in city or country, the latest fashion is followed with most scrupulous exactness, while no care is had to protect the body against the inclemencies of a changeable climate. In obedience to this "*higher law*," of fashion, some portions of the body are often exposed, even in mid-winter, with little or no protection; while other portions are occasionally enveloped in furs, shawls, &c., to an equally objectionable extent. So long as the clothing (which should be constructed with direct reference to the warmth and protection of the body) is made to please the fancy and flatter the pride, colds, fevers, and premature deaths, must of necessity continue to scourge our race. The poor, who perish from inability to procure abundant clothing, deserve our generous pity and compassion; but for the suicidal votaries of fashion, we can have but little sympathy, except to show them a better way.

The great abundance and variety of the articles of food which abound in this country, constantly afford temptations to an active and energetic people for an excessive indulgence of the appetite. The blood thus becomes overcharged with carbonaceous matter, or the digestive organs weakened by the excessive labor imposed on them, till

premature disease is easily induced. The poor often suffer for want of a sufficient supply of food, and then indulge to excess when a supply is present. Those in what are usually called "comfortable circumstances," suffer much less from improper management, in regard to warmth and food, than the affluent or indigent.

All classes suffer more or less from the want of good air. Nearly all the families in the various grades of society are exceedingly negligent in securing this important desideratum in their apartments. The sleeping-rooms are often small and close, and the apartments occupied during the day are warmed by close stoves, which are as destructive of health as they are economical of fuel. It is a matter of deep regret that the old fire-place, with its crackling fire, its dying embers, its thousand fancied forms, and its open flue, has been removed for the dark and cheerless air-tight stove. The fire-place is equally praise-worthy for the pure air and the cheerfulness it imparted to the social circle. The air-tight stove may have added to the longevity of the forests, but it is surely blanching the beauty and shortening the lives of the generation who have been so zealous in its invention and use. Bad air, such as is necessarily formed in every apartment that is occupied without some system of ventilation, is a poison that is constantly undermining the vigor of the constitution and impairing health.

Of this fact we have repeated examples in the numerous cases of ship-fever which occur in immigrant vessels that come to our shores from Europe. In these sailing pest-houses, from three to five hundred wretched beings are crowded together in the steerage, between two close decks, with only about seventy cubic feet of air to each passenger. It is no matter of wonder that in these close apartments, with the exhalations from bilge-water, from all sorts of food, and from several hundred unwashed bodies, cholera and ship-fever should commit their fearful ravages; while the same vessels, with a small number of passengers,

are almost always exempt from those evils on their return passage.

Improper treatment of infants and children is a most prolific source of disease and premature death. It commences with the first hours of existence, follows the growing child with unrelenting severity, till in many of our cities it hurries off to a premature grave the very large proportion of one-fourth during the first year and one-half in five or six years after birth. According to the statistical reports of various sections of the country, it appears that the mortality under ten years of age has been constantly increasing for the last half century. In the city of Boston, during the period of twenty years, from 1830 to 1850, the percentage of deaths under ten years nearly doubled. A mortality so fearful and unaccountable on any natural principles, seems to call for special consideration. The first act of attention the young infant receives is to be clothed according to the prevailing fashion. Fortunately for the young of other animals, nature clothes them in garments adapted to their condition; but the young of the human species require artificial clothing, and this is too often made to please the eye, rather than to meet the wants of nature. When dressed according to the American fashion, it exposes to the admiration of friends, and the cold of a changeable climate, the breast, neck, and arms; and, in some instances, portions of the lower limbs are unprotected. Through the neck and breast, the lungs and respiratory passages are exposed to the almost direct action of the changes of the weather. The blood that circulates through the hands and arms is very superficial, nearly all the vessels lying just under the skin, and possessing but very slight natural protection against the influence of cold. Children thus dressed, are seldom without cold hands and arms. Hence, almost the entire mass of blood flowing from these parts is thoroughly chilled before it returns to the heart, where it ~~mingles~~ with the blood from the general circulation, and is thrown into

the lungs to be again raised to its proper temperature by them, while their own heat is diminished by the external action of cold. Fortunately, however, the blood goes the round of the circulation so rapidly that an equilibrium is constantly maintained, and no very perceptible difference of temperature would be observed, except in the hands and arms; still, the true operation of this fashion of dressing children, on the blood, is in principle just as described. Indeed, there is not an equal extent of the entire surface of the unfortunate victim of fashion, that might not be left exposed in better accordance with its physical organization. In any other part of the body, the circulation is better protected, and would suffer less from exposure.

No period of life is so susceptible to the influence of cold, and at no period is the power of resisting it so feeble. Yet there is such a passion among American women to see the plump breast and round graceful arms of the young child, that multitudes fall victims to these vain fashions, notwithstanding every intelligent physician disapproves of the practice. A child, thus imperfectly protected against cold, will contract bronchitis, croup, inflammation of the lungs, or disease of the digestive organs, from the most trivial exposure. A current of air at the sides of the closed window or door, so trifling as not to be noticed by an adult, is sufficient to induce a fatal disease in an exposed infant. Each winter makes known to our experience instances of severe inflammation of the respiratory passages, induced by the slightest exposure, in spite of the most watchful and anxious care in all things except the one most essential—dress.

Another fruitful source of mischief in the management of children, is excessive and improper food. Instead of allowing them only the aliment nature has designed, they are fed on a mixed diet of whatever they can be induced to swallow. An apology for depriving the young infant of the nutriment which an All-wise Creator has provided

for it in the mother's milk, is found in disinclination, arising from false views of a mother's highest duty, or in actual inability, from feeble health. Not less than three-fourths of the American women reared in our cities are incapacitated for discharging the duties of a mother, by impaired health. Their offspring inherit more or less of the same frailty of constitution, and are then put on an artificial system of diet, characterized by an ignorant and blind disregard of all true physiological principles, with the almost certain result of swelling the fearful bill of infantile mortality. Among the poor, children suffer from actual neglect, from undue exposure, and from bad or insufficient food. Among the affluent, they are too often committed to the care of hireling nurses, to be over-fed, or to be constantly surfeited with candies and luxuriant food. Among the middle classes of society, the mother is neither above nor below the care of her own child; and, as we might anticipate, the rate of the mortality of children is much lower in these than in any other class.

Improper management in the education of children and youth has a tendency to shorten life. In some instances, children are ruined in health of body and mind by over-anxiety to develop too rapidly, or at too early an age, the intellectual powers. In some families, the children rule the house—parents and domestics are servants of their wills. Gratified and indulged in whatever they may choose to desire, they are educated to yield a most unrestrainable and profligate indulgence to the appetites and passions. In after-years, from want of self-control, they fall into vices that bring on premature disease, and persons thus educated are ill prepared to endure the trials and hardships of life; they are too often the victims of their own unbridled passions; and find, for the first time in their life, wholesome restraints in a lunatic asylum.

Not long since, a very interesting young lady of eighteen, the child of wealth and indulgence, became disappointed in love. For the first time in her life, her will

was crossed and her desires thwarted. Insanity was the result. When she was taken to the asylum, her father remarked to the physician, "I cannot think why this should make my daughter insane; she was never disappointed before in her life." The child is easily taught to bear disappointment; but it is often a difficult and dangerous lesson in riper years. A very large proportion of the inmates of our asylums have been brought there by causes resulting from improper education.

Among adults, the causes that induce disease are not unlike those that affect children. In this respect, "the child is father to the man." Those habits that render the child weak in health, and liable to disease, continue to act as direct agents, or as predisposing causes of disease. Those adults who have escaped the perils of childhood with vigorous health, too often waste it by excesses in sensual indulgence, or in bodily or mental labor, through the natural enthusiasm of impulsive youth. Thus, the strength which, carefully husbanded and sustained, might have kept the body and mind in activity and enjoyment up to the allotted period of "three score years and ten," is too frequently dissipated in early manhood.

Still, young men are exempted from evils that fall heavily on the other sex. While at school, the boy is allowed to follow the bent of his inclinations, during the intervals of study, and to seek in play that exercise which his nature imperiously demands. By this means, his body and its organs attain a certain development, though not as perfect as he might enjoy, if his education was conducted in strict accordance with physiological principles. The young miss of the boarding-school, on the other hand, as soon as she ceases to be a little girl, is discouraged from active exercise, as unbecoming her sex, and is taught to pass her leisure hours in a quiet, lady-like manner, at home, or in her room. If away at school, the only exercise she is permitted to take is a sedate, measured walk up and down the street, or around the square, once and occasion-

ally twice a-day. At boarding-school, she is permitted still less of unrestrained and healthful exercise. The delicacy and refinement of her sex here become so great, that the restless activity of youth must be kept in check by the power of the matron or teacher, and her walk will be taken in a solemn procession of her mates, two by two. A walk in a procession may afford some exercise to the limbs principally concerned in locomotion, but it is of very little benefit to the other organs of the body, while it certainly must fail to unbend and relax the mind.

Exercise, to benefit the young, must call into action all the muscles of the body as well as of the limbs; and it should also be of a character corresponding with the vivacity of youth—something into which the feelings and spirit can enter with enthusiasm and delight. An hour's exercise on a tread-mill, or in a walk, though better than none at all, does not meet the wants of the growing young of either sex. Hence a most marked difference can be seen between the countenances of those young ladies who are compelled to be "lady-like," and those who are permitted the unbounded and unrestrained pleasure of acting like little girls. By reference to tables of mortality, we find, on comparing the proportion of deaths among the two sexes, that the number of females who die between the ages of fifteen and thirty is greater than at any other period of life, and exceeds that of males at the same period. Dr. Warren, of Boston, in a very excellent treatise on *Preservation of Health*, says, "In the course of my observations, I have been able to satisfy myself that about half the young females, brought up as they are at present, undergo some visible and obvious change of structure; and, of the remainder, a large number are the subjects of great and permanent deviations; while not a few entirely lose their health, from the manner in which they are reared." A physician and professor, who is now unquestionably the highest medical authority in the city of New York, gave it as his opinion, to his class, that three-fourths

of the young ladies in the highest ranks of society are more or less deformed in structure and impaired in health.

A late and most judicious French writer, speaking of lateral curvature of the spine, tells us that out of twenty young girls who have attained the age of fifteen years, there are not two who do not present very manifest traces of that species of deformity. The causes of spinal distortion, in general, are whatever weakens the constitution. Want of exercise, and improper dress, are the more immediate causes. It is a very remarkable fact, that where there is one case of lateral curvature of the spine among males, there will be, on an average, as many as nine among females. And it is equally worthy of thoughtful consideration, that the number of young ladies, between fifteen and twenty-five, who enjoy full and uninterrupted health, is very small, compared with the other sex; and yet it will be found that girls are quite as healthy as boys, as long as they are allowed the same amount of liberal exercise. The education of females, as now generally conducted, is a most prolific source of serious physical evil, terminating in premature death, or in feeble health during a life of impaired usefulness.

A vast amount of sickness and disease might be avoided by a general diffusion of knowledge in regard to the means of preserving health. The great mass of our race live in ignorance of the laws of health, as if regardless of its value. It is lamentable to see those who claim to be highly enlightened on all other matters, regarding with indifference and apathy those subjects which are intimately connected with the health, life, and happiness of our race. Indifference to health, and ignorance of the means of preserving it, are unquestionably prominent causes of disease and premature death. Many seem to live as though a certain number of days or a certain length of life is allowed to each individual as his appointed period, which can neither be increased or diminished by his own conduct. Some seem to feel that there is so little apparent and immediate

connexion between the violation and the penalty of physical laws, that they cannot be made to realize that a vicious habit can injure them, so long as they are not actually diseased. In other words, they can see no connexion between debilitating habits and wasted health, unless they experience a severe pain, or are thrown upon a bed of sickness, the instant they indulge in that which is injurious.

Thus, a student who has been accustomed to much exercise, becomes unusually interested in his studies, omits his daily relaxation without the least consciousness that his body is suffering, till, by and by, he loses his natural vigor, becomes debilitated and feeble, and finally a confirmed invalid—a miserable sufferer throughout life. The glowing vigor of health is lost, and can seldom, if ever, be repaired. As time past never returns, so the generous impulses of health, once wasted, never return to a worn-out constitution. The transgressor of physical law is thus often overtaken, too late to be saved by repentance.

A vigorous constitution and an ambitious spirit may withstand for a long time the consequences of wrong living, and the health seem to be good up to a certain point, and then suddenly give way, apparently without any immediate cause. Thus, multitudes of men "*break down*," as it is called, sicken, and die, in consequence of living in the violation of the laws of health, without ever realizing the true cause till it is finally too late. It is nevertheless true that there are hidden causes of disease, which sometimes scourge our race. Disease occasionally moves mysteriously through the air we breathe, or seems to hang over particular locations, cutting off, as with the besom of destruction, all grades and classes of men. Dysentery, when it prevails as an epidemic, typhus, typhoid, and yellow fevers, and the cholera, are commonly regarded as a class of diseases which we have less power to avoid or prevent than any others. But even these are often generated by causes which are supposed to exist through ignorance or indifference to proper sanitary regulations. The most malig-

nant epidemics are not unfrequently limited to a certain neighborhood, a particular street, a block of buildings, or follow the course of a single stream of water, or along the shores of a certain pond. In "a section of the town of Sheffield, Mass., not over one and a half miles in diameter, in the vicinity of a pond, known as Hubbard's Pond, which contains about one hundred families, or six hundred inhabitants, over three hundred were sick, and forty-four died. Among one hundred and fifty who lived near the pond on the south-easterly side, less than ten escaped; of those on the westerly, about fifty more were affected. The cause of this remarkable sickness was attributed to this pond. A dam was built at the outlet, and at times of high water, a large tract of land was overflowed. In dry seasons, the water was drawn off, and large quantities of decomposing vegetable matter were exposed to the action of the sun, which produced a poisonous exhalation or *malaria*, which affected nearly all who inhaled it."*

"Near the village of Pittsfield, (Mass.,) between forty and fifty years ago, a mill-dam was erected, which caused the water to set back, and cover over more than one hundred acres of land, then clothed with its native forest-trees of soft maple, alders, red ash, &c. Soon afterwards all the timber perished; then commenced bilious fevers, and the fever and ague, as it was called. It was very sickly; many died; all were alarmed. The owner of the mill was prosecuted, and the dam destroyed. The sickness ceased soon after the destruction of the mill-dam."†

Dr. T. Southwood Smith, professor in the London Fever Hospital, gives the following testimony: "In some localities there was not a single house in which fever had not prevailed, and, in some cases, not a single room in a single house, in which there had not been fever. The districts in which fever prevails, are as familiar to the physicians

* Report of the Sanitary Commission of Massachusetts. 1850. p. 72.

† Report of the Sanitary Commission of Massachusetts. 1850. p. 76.

of the fever hospital, as their own names. In every district in which fever returns frequently, and prevails extensively, there is uniformly a bad drainage, a bad sewerage, a bad supply of water, a bad supply of scavengers, and a consequent accumulation of filth; and I have observed this to be so uniformly and generally the case, that I have been accustomed to express the fact in this way:—If you trace down the fever districts on a map, and then compare that map with the map of the commissioners of sewers, you will find that wherever the commissioners of sewers have not been, there fever is prevalent; and, on the contrary, wherever they have been, there fever is comparatively absent. Some idea may be formed of the evils which our negligence in the matter of sewerage and drainage inflicts, when I tell you that the annual deaths from typhus fever amount to 16,000, and the attacks of this loathsome disease to between 150,000 and 200,000."

The cholera, as if commissioned by High Heaven to scourge men for their reckless indifference to the laws of personal and public health, has confined its fearful ravages almost exclusively to the most crowded and unhealthy portions of densely populated cities. During 1848 and 1849, this pestilence raged in New York with extraordinary malignity in a number of particular localities. One of these sections "was crowded with newly-arrived Germans, living in habits of personal and domestic filth." In another "the great mortality was ascribed to pits and pools of stagnant water, and to numerous horse-killing and bone-boiling establishments."* In Boston, "the lower parts of the city, where the drainage is difficult, and the cellars more or less invaded by the break-water; those reclaimed from the ocean, and those in the vicinity of marshes, were invaded by the pestilence. In nearly all those localities, an over-crowded population, bad ventilation, insufficient and unwholesome diet, *intemperance*, and the entire absence

* Starr on Cholera, New York Journal of Medicine. 1851.

of cleanliness, have been most efficient adjuncts in assisting the operation of other causes. So many instances might be cited, from our personal knowledge of the localities where the majority of the cases occurred, that we are quite certain that the influences alluded to above are, as a universal rule, the exciting cause of the disease, with the occasional exception of those cases which are evidently produced by an unusual indulgence or excess."*

If any reliance can be placed on the testimony already given, and much more that might be presented, a large share of those who fall victims to the fearful epidemics which occasionally rage in particular localities, might be saved by an intelligent obedience to the laws of personal and public health. But so long as our cities abound in districts where the unfortunate victims of squalid poverty herd by scores in damp cellars, and in ill-ventilated apartments above ground, in every pent up alley and narrow street, and so long as stagnant cesspools and drains send forth their poisonous exhalations to contaminate the air of whole districts, so long will cholera, typhus fever, and malignant dysentery commit their fearful ravages.

That in every community there is a vast amount of unnecessary and avoidable sickness, is the unanimous testimony of all intelligent physicians. The health commissioners of Massachusetts, in their very able report to the legislature, gave the following condensed views: "We believe that the conditions of perfect health, either public or personal, are seldom or never attained, though attainable;—that the average length of human life may be very much extended, and its physical power greatly augmented;—that in every year, within this commonwealth, thousands of lives are lost which might have been saved;—that tens of thousands of cases of sickness occur, which might have been prevented;—that a vast amount of unnecessarily impaired health and physical debility exists

* Report of the Sanitary Commission of Massachusetts. 1850.

among those not actually confined by sickness;—that these preventable evils require an enormous expenditure and loss of money, and impose upon the people unnumbered and immeasurable calamities, pecuniary, social, physical, mental, and moral, which might be avoided;—that means exist, within our reach, for their mitigation or removal;—and that measures for prevention will effect infinitely more than remedies for the cure of disease."

Having already considered, at greater length than was originally designed, the general causes of disease, some of the special causes will be investigated in connexion with the hygiene of particular organs.

CHAPTER III.

ORGANS OF RESPIRATION.

FUNCTION OF RESPIRATION—EVILS OF COMPRESSING THE RESPIRATORY ORGANS—PURE AIR ESSENTIAL TO HEALTH—MAINTENANCE OF ANIMAL HEAT—ARTIFICIAL HEAT AND CLOTHING.

ALL animals are provided with some kind of respiratory organ, by which the blood or circulating fluid is brought under the influence of atmospheric air. In this process, the air and blood mutually act on each other, producing important changes in the composition of both. The blood parts with a portion of its carbon and hydrogen, and receives oxygen from the air, which in turn becomes impure by an increase of carbonic acid. It has been estimated that a quantity of blood, equal to the whole amount in the body, is thus exposed to the renovating and vitalizing influence of the air in the lungs as often as once every minute, and that every adult man daily exhales from his lungs some thirty ounces of waste matter, and absorbs nearly the same amount of oxygen.

These changes, which are constantly taking place by the action of air upon the blood, are a kind of combustion, by which the body is warmed and maintained of a uniform

PLATE II.

PULMONARY CIRCULATION.

PLATE II. is designed to illustrate the manner in which the blood is changed from venous to arterial in its passage through the lungs.

a, The right auricle receives from the vena cava the impure and carbonized blood which has been taken up from the general circulation by the veins, and empties it into the right ventricle, b, which propels it through the pulmonary artery, c, to the right and left lung, where it is distributed by minute capillaries over some six hundred millions of air cells. The carbonic acid which gives the venous blood its peculiar dark purple hue permeates the walls of these cells, and escapes from the lungs at every expiration. At the same time a quantity of oxygen is absorbed from the air, which is taken into the lungs at each inspiration. By this process, the venous blood is gradually changed from a dark purple to a bright scarlet, and returned to the left side of the heart pure arterial blood, renovated for the nutrition and growth of the body.

In the figure, only one set of vessels is represented on a side. On the right side, at d, is shown the right branch of the pulmonary artery, dividing into numerous small branches, which finally terminate in the capillary vessels that are spread over the surface of the air cells. The color of the blood, as represented in the figure, gradually changes as it passes into the smaller vessels till it finally becomes fully oxygenated or arterialized. On the left side of the figure the pulmonary veins are represented as taking up the arterial blood and returning it through the pulmonary vein, e, to the right auricle, f. The left auricle empties it into the left ventricle, g, whence it is propelled through the great aorta, h, to the *systemic* or general circulation.



temperature. The oxygen of the air, which combines with the hydrogen and carbon taken up from the tissues by the blood, produces heat and watery vapor by the same process that it renovates and vitalizes the blood. In ordinary combustion for the production of artificial heat, the chemical process is essentially the same. The carbon of wood and coal combines with oxygen to form carbonic acid and evolve heat. Thus, we have two objects, both of which are indispensable to the manifestations of vital power, accomplished by the function of respiration. Still, the ordinary efforts of respiration are so gentle and noiseless, that we can hardly appreciate the vast importance of this function in the animal economy. Health and life itself are dependent upon its proper exercise. Indeed, the respiratory and circulating apparatus may be regarded as the main-spring of all vital action—as the energizing power by which all the other organs are made to play their part.

The lungs are made up of numerous air-cells, upon each of which is distributed a minute termination of the pulmonary capillaries. There are some six hundred millions of these minute air-cells in the human lungs collectively, presenting a surface more than thirty times that of the whole body. A healthy man receives into his lungs, at each inspiration, about a pint of air; and, breathing at the rate of eighteen times per minute, he requires not less than fifty-seven hogsheads of air every day—a quantity that would hardly seem compatible with the small apartments in which many confine themselves during the greater portion of the year.

To a reflecting mind, no argument would seem necessary to prove the importance of preserving the action of organs charged with such important duties in the animal economy, free and unrestrained, though we have abundant evidence that a large and highly respectable portion of our race are constantly suffering from this evil. By a reference to PL. VI., *Class Book*, it will be seen that the capacity of the lungs is increased and diminished by the

alternate depression and elevation of the walls of the chest, together with the contraction and elevation of the muscles of the abdomen. Whatever therefore constrains the free play of the walls of the abdomen and chest, interferes so much with the natural process of respiration. The lungs themselves being comparatively passive in respiration, the facility with which this function is performed depends almost entirely on the freedom with which the respiratory muscles of the chest and abdomen are allowed to act.

Though we would fain hope that stays and corsets are known only as the relics of a less enlightened age, an ambition to possess a small and tapering waist still lives, as a blighting curse to a very large class of the otherwise fairer portion of our race; and though public sentiment has long since disapproved of those mechanical instruments of disease, other appliances are not wanting to give a *fashionable* turn to the female waist, and constrain the free exercise of the most important organs we possess. It may not be the legitimate province of Physiology to teach the proper style of dress, but the principles of the science should be known by our tailors and mantua-makers, and the model of Grecian beauty should occupy a place in their diagrams of the "latest fashions," or they should cease to be represented on the vain shadows of distorted human forms: for it is no matter of wonder that, with such images to copy from as the *beau-ideal* of fashion and style, they seldom give us, however much desired, garments that are comfortable and easy in accordance with health. Public lectures and the press have exposed the evils of tight dressing, with a good degree of plainness and fidelity, and some reform has followed; yet the great mass of our ladies, and many gentlemen, are still suffering from this plain violation of nature's laws. Probably nine-tenths of our well-educated females, above twenty years of age, and many that are younger, have suffered more or less from deformity or weakness of the spine, caused by this besetting sin of American ladies. How many of this

number are afflicted with diseases of the lungs, induced by constant compression of these vital organs, can never be known. Every intelligent physician, who has been observant of the cause of impaired health, can testify that the evils resulting from compression of the respiratory organs are more numerous, as well as more common, than most persons are aware of. Just in proportion as the lungs are constrained in their action, does the respiration become more frequent—wearing and exhausting the power of these organs, in the same manner that a piece of machinery will wear out faster when it is propelled beyond its appropriate velocity. It is owing to the diminished capacity of the respiratory organs that persons tightly dressed can take only moderate exercise without inducing that hurried respiration called "*panting*." The lungs seem struggling with intense effort to perform their office, while the whole system is suffering from the imperfect oxygenation of the blood. The extremities are habitually cold, and the countenance pale and sickly, from a feeble circulation of the vital fluid, and the subject becomes an invalid for life, or an early victim of disease. Multitudes suffer in this way without ever suspecting the true cause; for the capacity of the chest is not often diminished by any sudden constraint or violence, but by a constant pressure for several years, when the bones are in a state to be easily moulded to any form the dress may require.

A due supply of pure air may be regarded as an essential condition of healthy respiration as a law of our existence. The body can no more be preserved in a state of health, while breathing impure and poisonous air, than life can be continued in a vacuum where the air has been exhausted. We consume a certain amount of air at each respiration, and throw out a corresponding amount of carbonic acid. In this process, the vitalizing principle is exhausted, and the air charged with a highly poisonous gas. The air, in its natural state, contains nearly four-fifths of nitrogen, and about one-fifth of oxygen. The

nitrogen, which is lighter than common air, can be obtained quite pure by passing up a lighted taper into an inverted jar, and burning out the oxygen, when the taper will cease to burn for want of oxygen to supply combustion. If an animal be placed in this, it will gradually cease to breathe, not because of any injurious influence of the nitrogen itself, but simply from the absence of some supporter of animal life. The chief use of nitrogen seems to be as a dilutent of oxygen, which, if pure, causes bodies which are combustible in common air to burn with great intensity, and animals to have their respiration, circulation, and other animal faculties, stimulated to a more rapid action. The oxygen is the only element of the air that is a sustainer of life. It gives to the blood its power of nourishing the body, and imparts its energy and power to all the mental and animal powers. The invigorating influence of a clear, cool morning, is owing mainly to the presence of a liberal supply of this life-giving principle in the air. When it becomes rarified by mid-day heat, we inhale in the same volume of air a smaller amount of oxygen, and are consequently more languid and less inclined to active exertions. If the amount of oxygen in the air we breathe be reduced by respiration or otherwise below the quantity found in the purest atmosphere, the vital energies of the system must of necessity be correspondingly reduced below the standard of health. Thus, just in proportion as the oxygen becomes exhausted from the air of a room by the constant respiration of its occupants, or by the burning of lights and fuel, does it become incapable of sustaining the full vigor and tone of the vital powers. The energy of the nervous system, the activity of the circulation, and the processes of secretion, &c., are all depressed below the natural standard. If air with a diminished quantity of oxygen be breathed constantly or habitually, the countenance becomes pale and sallow, the eye dull and languid, and the general health feeble and sickly.

But the consequences of occupying ill-ventilated rooms

are still more pernicious, from the presence of carbonic acid, which is a direct poison—universally fatal to animal life when administered in sufficient doses. It destroys life from its own properties, and not from its mere negative qualities. It is also a non-supporter of combustion: a lighted taper, when put into it, is instantly extinguished; animals, when plunged into it, die immediately after its first inhalation. Its poisonous quality begins to be manifested when it exists only in one portion to one hundred of common air. The air, as it is exhaled from the lungs, contains, in every twenty-six parts, one part of carbonic acid, and is therefore highly poisonous if breathed again. The first symptoms of poisoning by this gas are such as have been experienced by every one who has ever been present in a crowded assembly, or has slept in a close room. Throbbing of the arteries, dull pain in the head, drowsiness, languor, and a sense of fatigue, with disinclination to exertion, are the first indications by which this common poison makes its presence known. These symptoms go on increasing in intensity till profound stupor and death ensue. The premonitory symptoms of this poison can be observed in almost every public assembly, where there has been no special effort to secure thorough ventilation, or even in private rooms heated by close stoves. In any ordinary public room, without ventilation, the sensible effects of this poison will become manifest in a full assembly in about an hour's time. In from two to three hours, an entire audience will be suffering from weariness, languor, head-ache, and cerebral oppression. Persons of feeble health are frequently unable to attend the exercises of church on the Sabbath-day, while they have strength to endure twice as much in the open air or in a well-ventilated room.

Private apartments are not exempt from the health-destroying presence of this insidious poison. American ladies are proverbial for losing their freshness and beauty when quite young, and well they may be, considering the

kind of air they breathe. They too often resemble the frail and colorless green-house plants, that are but miserable apologies for the species they represent. When we consider the delicate structure of the six hundred millions of air-cells that compose the lungs, and the fact that pure air is the natural element of our existence, it is no wonder that from one-fourth to one-third of our race fall victims to lung diseases, when, as a people, we are in the habit of breathing over and over again the same air, till it becomes exhausted of its oxygen, and charged with carbonic acid, and with the loathsome exhalations of fetid mouths and unwashed skins.

In private and public assemblies—in bed-rooms, parlors, halls, and churches—the American people are accustomed to breathe over and over again the same air, with its accumulating impurities, till the very life-blood has become so contaminated as to impart the peculiar hue of imperfectly oxygenated blood to the countenance of the in-door classes. Rail-road cars and steam-boats, the great thorough-fares to retreats of health for the masses, are more truly repositories of poisonous gasses than salubrious and wholesome apartments. Most of the rail-road cars are good specimens of mechanical skill—having the windows and doors each a "*snug fit*," and are heated with close stoves—a small register in the top serves as a sort of safety-valve to let off the poisonous air; but no adequate means exist for a thorough ventilation, except by opening the doors or windows, which is rarely tolerated by the travelling public, who seem to dread nothing so much as a little cool air.

Even the first class steam-boats—those floating palaces which mark the water-craft of the nineteenth century as vastly superior to any former age—though vieing with each other in the magnificence and splendor of their finish and furniture, are almost entirely destitute of any efficient means of securing pure air in their luxuriantly-embellished apartments. Chairs, settees, divans of a style that an

oriental princee might be proud of, abound throughout the spacious cabins; above and below there is a profusion of all that can contribute to convenience or comfort, except air. For unadulterated air—the commonest, the cheapest, and the most essential to living men of all God's gifts—there is no provision: night after night hundreds of men and women, in the treble tiers of boxes in their respective cabins, breathe over and over again the polluted air that has passed from mouth to mouth, and spend the weary hours in vain efforts to sleep. If any one doubts that the half-sleeping, half-dreaming restlessness of such a night, and the head-ache and languor of the subsequent morning, is owing to impure air, let him go forth at an early hour from the fetid atmosphere of the cabin to the open deck; and, when his faculties are fully refreshed, return again to this repository of poisonous air, and mark the contrast, both in the impression on his senses and in his every feeling and emotion.

If there be any palliation or excuse for the almost universal indifference to the evils of impure air, it is to be found in the fact that, this poison works its mischief on the vital organs insidiously and unobserved. Could we perceive the impurities of the air, as it passes from lung to lung, we should shun crowded assemblies and ill-ventilated rooms as we would the plague or the cholera; but most men are slow to believe that an invisible cause can ever produce a visible effect. When a malignant disease spreads from house to house, and from city to city, men are ready to take alarm, and escape to places of supposed safety; but when poisoned air is diffused through our public assemblies and private apartments, causing slow and insidious disease, no alarm whatever is felt. Men seem to have no just appreciation of the fact that air, pure and unadulterated, is an essential element of our existence—an indispensable condition to the perfect performance of the functions of animal life.

The maintenance of animal heat is the most important

and the most trying work of the lungs, in all temperate climates; since they are almost daily subjected to some vicissitude or change. The air inhaled, often varies several degrees in a few hours, and in some instances, in a few minutes, the individual being at one moment in a room at summer heat, and the next in the open air at a temperature below zero. The delicate membrane that forms the six hundred millions of air cells in the human lungs, though admirably adapted to its office, is nevertheless subjected to a severe trial by the sudden changes of the temperature to which it is exposed. The amount of heat necessary to maintain a uniform temperature of the body is equally variable. No organ of the body enjoys so little uniformity in the performance of its functions as the lungs, and no other is so liable to disease. But it is equally true, that diseases of this most delicate organ diminish just in proportion as the temperature becomes more uniform—prevailing most during those months and in those localities where the weather is most variable. It may, therefore, be regarded as a law of our organization, that the body should maintain as uniform a temperature as possible. In New England, during most of the year, we can live up to this law only by the use of artificial heat and clothing. Artificial heat, as produced by fires, is far more likely to be too high than too low for the welfare of such as enjoy the means of procuring this comfort; because we cannot at all times be within doors, and the change, on going out, is proportionate to the degree of heat within. Clothing is, therefore, the most uniform and the most reliable protection against cold. The cause of the sensation of cold in the body, or any portion of it, is the conducting of the natural heat from the body to the surrounding medium. This takes place at all times when the temperature of the body is higher than that of the air. The object of clothing is not to create heat around the body, but to preserve that which is constantly forming. The best protection, therefore, is that kind of cloth-

ing which is the worst conductor of heat. Linen is a good conductor of heat, and may, therefore, be worn in warm weather, when we wish to reduce the temperature of the body, instead of maintaining it; but woolen and furs are very poor conductors of heat, and form the best articles of dress in cold weather.

The amount of clothing must depend upon the season of the year, the exposure, and the capacity of the individual for producing heat. In the young, and in the aged, this faculty is at its lowest power, and they require more clothing than those in the middle and prime of life. Those who are subjected to an external exposure, require more than those who remain in-doors. The clothing should at all times be sufficient to preserve a comfortable warmth of the whole body during any ordinary exposure, and should be increased in proportion to the length and severity of the exposure. The extremities are the most exposed to the influence of cold, and require the best protection, though they are apparently the least cared for by a majority of persons. Any one who is accustomed to riding, may know, by experience, that the rest of the body is warm enough, so long as the hands and feet can be kept warm. Many persons bundle up the neck and throat to sweating point, while the extremities hardly enjoy a moderate protection. Such persons are the most likely to be afflicted with colds. The neck requires no more clothing than any other part; and the effect of shawls and fur collars is to invite an unusual supply of blood, which is driven away when the extra appliances are removed, giving rise to sudden chill and congestion, followed by inflammation. Garments that fit the person loosely, afford more warmth than such as are called "a snug fit;" for the reason that there will be a space for air left between the clothing and the body, through which the heat will be conducted from the body less rapidly, on the same principle that the warmth of a room is preserved by using double windows, with a stratum of air between

them Any one who has been caught out on a cold day, in a pair of tight boots, will need no argument to prove the correctness of this assertion.

CHAPTER IV.

DISEASES OF THE ORGANS OF RESPIRATION.

CROUP, BRONCHITIS, PNEUMONIA, CONSUMPTION.

THE respiratory organs are liable to several distinct diseases, which receive their names from the part affected. Thus we have laryngitis (croup), or inflammation of the larynx; bronchitis, or inflammation of the air-tubes or bronchi; pneumonia, or inflammation of the substance of the lungs. The lungs are also subject to a disease of a chronic character, which is the cause of more deaths than any other known disease: this is called *phthisis pulmonalis*, or pulmonary consumption.

There are several varieties of croup, but they resemble each other so closely that they can hardly be distinguished, except by a physician who has made himself familiar with the disease in its different forms. The present description will therefore apply only to the more general features of the disease. The invasion of croup is usually very sudden, though it is often preceded for a few hours, or a day or two, by hoarseness and cough. The child may be seized while at play or during sleep with a loud barking cough; the voice and cry are hoarse, and almost entirely lost; the respiration, which is more frequent than natural, is attended by a shrill, wheezing sound, and becomes more and more difficult and labored, till suffocation and death ensue. The disease is confined mostly to the lining membrane of the larynx, though it sometimes extends down to the bronchi. Croup usually runs a rapid course to a fatal termination unless speedily relieved. The chance of saving the patient, in all cases,

depends upon early and appropriate treatment. A delay of a single hour may be fatal. The first moment of alarm announces danger, and calls for immediate action. A physician should be sent for at once. When the physician is not near by, or cannot be obtained readily, an emetic may be administered, and the patient put in a warm bath, at a temperature of about ninety-six degrees Fahrenheit. For a child six or seven years of age, either of the following may be given as an emetic: A tea-spoonful of pulverized ipecac, stirred in six of water, and one administered every ten minutes; or the same quantity of Hive Syrup, repeated every twenty minutes. If neither of these can be obtained readily, or if they fail to produce the desired effect, give, in a little syrup, a tea-spoonful of pulverized alum, and repeat every ten minutes.

The most common cause of croup is exposure to cold, either in passing from a warm into a cold atmosphere, or prolonged exposure. Persons who are at all liable or predisposed to cold, should always be warmly clad, and put on additional clothing in damp, chilly weather, or when unusually exposed. For two or three days following an attack of croup, the patient should be confined in a warm and dry, but a well-ventilated room, as the disease is very likely to return with the slightest exposure. The diet should be light and easy of digestion. The foregoing brief directions for the treatment of croup, are given for the benefit of those who cannot avail themselves of the aid of a physician at an early moment after the attack, and not as a system of domestic practice. A disease so grave and critical as croup, requires the experience and skill of an intelligent physician, and the friends should be very slow to rely on their own resources when better aid can be obtained.

BRONCHITIS.

Bronchitis usually commences with a dry cough, accompanied by the expectoration of a transparent, pale, and watery fluid. There is a sensation of heat and tightness across the chest, and occasional chills, followed by paroxysms of fever.

PNEUMONIA.

Pneumonia, which is often called *lung fever*, or inflammation of the lungs, commences with a severe chill, accompanied or followed by severe pain in one side or the other. The breathing is rapid and short, and accompanied with more or less pain when a long inspiration is taken. There is a short and *hacking* cough, and an expectoration of bloody mucus, or mucus streaked with blood.

In a large majority of cases, bronchitis and pneumonia are both caused by cold, by a sudden checking of the perspiration, by long-continued exposure to cold, or by a sudden change from warm to cold air. Unless relieved by early and appropriate treatment, bronchitis and pneumonia are both severe diseases. According to the best information on the subject, they are the causes of at least one-tenth of all the deaths. The number of deaths among children, produced by the acute diseases of the respiratory organs, is not less than one-fourth of the whole number. In a great majority of cases, the above diseases are the result of avoidable causes, of improper exposure, or the neglect of suitable clothing to protect the body against sudden changes of temperature. Bronchitis and pneumonia both require the aid of medical skill, though the warm bath, faithfully administered at the very outset, may, in most cases, greatly mitigate the severity of the attack, and, in some, speedily relieve the disease.

In a large proportion of cases, croup, bronchitis, and pneumonia, are the result of avoidable causes, and may

be regarded as a class of diseases which may be almost entirely prevented by a faithful observance of the laws of health. Cold bathing of the whole person every morning, a sufficient amount of clothing to protect the body, and proper care to avoid too sudden changes of temperature, are means which would secure exemption from a vast amount of sickness, and greatly diminish the bills of mortality from these causes.

CHAPTER V.

CONSUMPTION.

PROPORTION OF DEATHS—THE CAUSES—HEREDITARY PREDISPOSITION—SCROFULA—IMPERFECT NUTRITION—TIGHT-LACING, AND CONFINED POSTURES OF THE BODY—SIGNS WHICH CHARACTERIZE A CONSUMPTIVE CONSTITUTION—SYMPTOMS, AND MEANS OF PREVENTION.

By consumption, is meant the wasting of the body from the effects of a disorganizing process in the lungs. It is a constant visitor in all parts of our country; it seeks its victims from the mountains and vallies of New England; from the prairies and low-lands of the west; from the cities and rural districts of the South; along the sea-shore, and along the lakes and rivers of the interior. Every where it proves itself the great destroyer of human life, and takes the first rank as an agent of death. No climate, no latitude, is entirely exempt from its fearful ravages, though it is supposed to prevail more extensively in temperate than in hot or very cold climates. Particular localities, especially such as are exposed to damp and bleak winds and sudden changes of temperature, are most favorable to its development; while in places which enjoy the greatest uniformity of temperature, it prevails least. According to the report of the Sanitary Committee of Massachusetts, (1850,) it bears the following proportion to the

number of deaths from all causes: In the state of Massachusetts exclusive of Boston, 1 in 4·63.

In Boston,	1 in 5·58	In Philadelphia,	1 in 6·81
" Salem,	1 in 4·47	" Baltimore,	1 in 5·77
" Lowell,	1 in 6·63	" Charleston, S. C., . .	1 in 6·58
" Portsmouth, N. H., .	1 in 4·80	" England,	1 in 6·20
" Providence, R. I., .	1 in 4·22	" London,	1 in 6·97
" New York city, . .	1 in 5·10	" Paris,	1 in 5·55
" New York state, . .	1 in 4·00		

According to the above table, from one-fourth to one-seventh of all the deaths in the United States, and in London and Paris, are from Consumption. A disease so peculiar in its character, and so fatal to our race, seems worthy of special attention, though it is not the author's design to enter the lists with those who claim to have made some wonderful discovery, or to have found out some infallible remedy for its cure. Multitudes of such pretenders have arisen and flourished, but Consumption still marches on to its fearful work of death, regardless of new theories and new systems of practice.

Consumption is induced by a variety of causes, the most important of which are hereditary predisposition, scrofula, imperfect nutrition, and exposure to cold. The hereditary origin of Consumption is fully established by the testimony of almost all writers on the subject. It is well known that in some families nearly every member, if not cut off prematurely by some other disease, falls a victim to this. Some peculiarity of constitution is transmitted from one generation to another. In some families, where this hereditary peculiarity exists, the tendency to it is stronger in some members than in others. Some brother or sister will escape, while all the others are taken; but the same consumptive taint will develop itself in the next generation. Thus, we often meet with cases of hereditary consumption in persons whose grand-parents may have had the disease, but whose parents have escaped it.

Scrofula and consumption are so closely allied to each other, that the children of scrofulous parents are often con-

sumptive, and the children of consumptive parents are equally liable to scrofula. Scrofula manifests itself in all the following ways:—in enlargement of the glands of the neck, arm-pits, &c.; in hip-joint disease, in disease of the bones of the vertebrae, or in tubercular disease of the lungs. It not unfrequently happens that examples of all the above diseases may be found in the different members of the same family.

A scrofulous or consumptive tendency may be induced in the constitution by imperfect nutrition, whether from deficient or improper food, or from a permanently disordered state of those organs which digest and take up nourishment. Unhealthy air—whether from closeness, moisture or deficient ventilation—frequent or long-continued exposure to cold, with insufficient clothing; depressing passions—such as disappointed love, anxiety or distress from reverses of fortune—may induce the consumptive disposition in those not constitutionally predisposed to it. Confirmation of this may be found in the fact, that cows and other domestic animals, when confined in close and damp stables in the city, become tuberculous, and rabbits may be rendered so by confinement in a close place, with bad food and air for only a few weeks.

Dr. Charles A. Lee says: “The frequency of scrofula among the inmates of our orphan asylums has frequently attracted our notice, and several years since we entered upon a careful investigation of the causes. In a large majority of instances, we distinctly traced it to errors in the dietetic management—the food not being sufficiently nutritious, and composed too largely of vegetable matters. Thin soups, with but little tender meat, light gruels, mush and molasses, and a poor quality of bread, with but rare and scanty allowance of milk, and that often diluted, made up the diet; while, at the same time, they slept in crowded, confined, and ill-ventilated apartments, and seldom enjoyed the luxury of a bath. They consequently had a sickly, blanched, leucophlegmatic appearance, with a miserable

look of premature age, anxiety, and distress, instead of the joyousness of youth stamped upon the features. On substituting a more liberal allowance of animal food—such as good milk, butter, and tender meats, with rice, potatoes, and a better quality of bread—a marked change was immediately observed. The children became more florid, active, playful and cheerful, and the serofulous indications gradually disappeared. Facts, however, warrant the conclusion that serofula may be developed from sleeping in ill-ventilated places, even when the food is of proper quantity and quality. We have seen this, in several instances, in large boarding-schools, and in children of both sexes; and we look upon the breathing of impure air at night as one of the most frequent and efficient of all the causes of this disease in our country.”*

Compression of the chest, and tight-lacing to such an extent as to interfere with the free movements of the respiratory organs, or a confined posture of the body in a sedentary employment, are frequent causes of consumption. Tailors, shoe-binders, shoc-makers, milliners, lace-makers, printers, engravers, jewellers, watch-makers, clerks, &c., are more liable to consumption than those engaged in more active employments. But the number of females who fall victims to the disease is considerably larger than the males till about thirty. Near this age, the proportion of each is nearly equal. In Massachusetts the number of females who died of consumption, between the ages of twenty and thirty, is nearly double that of the males—being 1409 of the former to 708 of the latter. From thirty to forty, the proportion is nearly the same.†

Consumption selects its subjects from the most hopeful and the most productive periods of life, between the ages of twenty and thirty years; and the conviction that a large portion of his readers may belong to a class of persons who have not reached that fatal period, furnishes an inducement

* Copland’s Practical Medicine, vol. iii. p. 800.

† Sanitary Commission of Massachusetts. 1850. p. 96.

for the author to describe the signs and symptoms which indicate the approach, and mark the progress of this fearful malady, in the hope that its insidious progress may be detected, in some cases at least, before it has made sure of its victims.

The signs which characterize a consumptive or scrofulous constitution are—a moist, blue or deep-black eye, with a sclerotic of almost pearly whiteness, and long eyelashes. The skin is either unusually white, or very dingy and dark, with an agreeable redness of the cheeks, that gives an appearance of beauty and a deceptive indication of health—which the friends too often regard as real, and as indicating a good constitution.

No disease is more insidious in its commencement, and more deceptive in its progress, than consumption. In perhaps a majority of cases, it becomes permanently seated and incurable before its subject is aware of its presence. In its first stages, it is seldom attended with much pain; or, with pain about the shoulders and chest, so trifling as to create no alarm, or to be referred to some other than the true cause. Nor is it always preceded by a cough. Tubercles, which may be regarded as the germs of the disease, are often deposited before the cough commences, or while the cough is not sufficient to attract attention. The first symptom, however, which plainly indicates the true nature of the disease, is usually a dry, hacking cough, accompanied, or soon followed, by paleness of ~~the~~ countenance, and general debility. These steal on, with little apparent reason for apprehension, till tubercular deposition has so far taken place, that the disease runs a rapid course to a fatal termination. In other cases, the disease follows one or more severe colds, or inflammations of the lungs, or a fever accompanied by pectoral symptoms. In other cases still, the patients have been out of health, or in a debilitated state, before the commencement of any cough. In most cases, there is but little pain or suffering, till the very last stages of the disease, and the unfortunate victim

is seldom aware of its progress, except as it is learned by an increasing weakness and inability to endure accustomed labor or exercise. The subject of the disease, for the most part, is cheerful and full of hope, and unconscious of the destructive process that is wasting the vital powers. A kind of balance seems to be maintained between all the functions, that secures exemption from suffering. As the available portion of the lungs is diminished, the mass of blood that has to pass through them becomes less and less, and the wasting of the body and the failing of the strength seem to keep pace with the decay of the lungs. Thus the descent is easy, and the parting of the last filament of life very gentle.

Again and again has the discovery of a new and infallible remedy for consumption been announced, and almost every medical journal contains some account of the beneficial effects of some new course of treatment. Although a few instances have undoubtedly occurred where persons clearly marked as its victims have escaped, yet the great majority who have the disease once seated, fall before it, in spite of all that science or art can do. The only reliable course is in preventing or avoiding its grasp. Where strong predisposition exists, it can be avoided only by the most rigid observance of the laws of health, and an early removal to a climate where it does not prevail. When there is a hereditary predisposition, change of climate will rarely prove efficacious, unless at the very commencement of the disease, and while the general health is but slightly impaired. The greater portion of those who resort to a warm climate, forsake the comforts and consolations of home for a death and burial among strangers. Change of climate should never be resorted to after all hopes of other means have failed, and when the chance of recovery at home is becoming hopeless. Those persons in whom the disease has not made much progress, or who have only the premonitory symptoms, may reasonably hope for relief, if not for a perfect cure, from a residence in a warm cli-

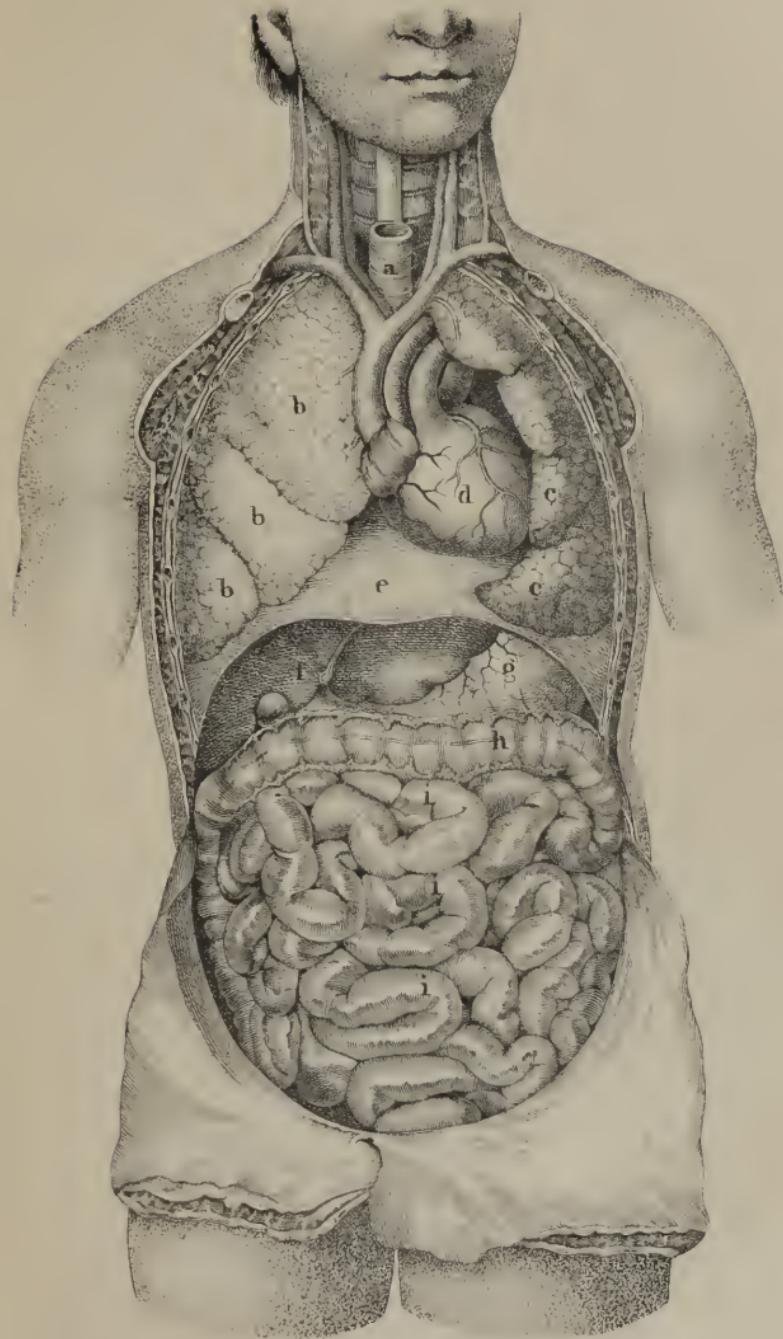


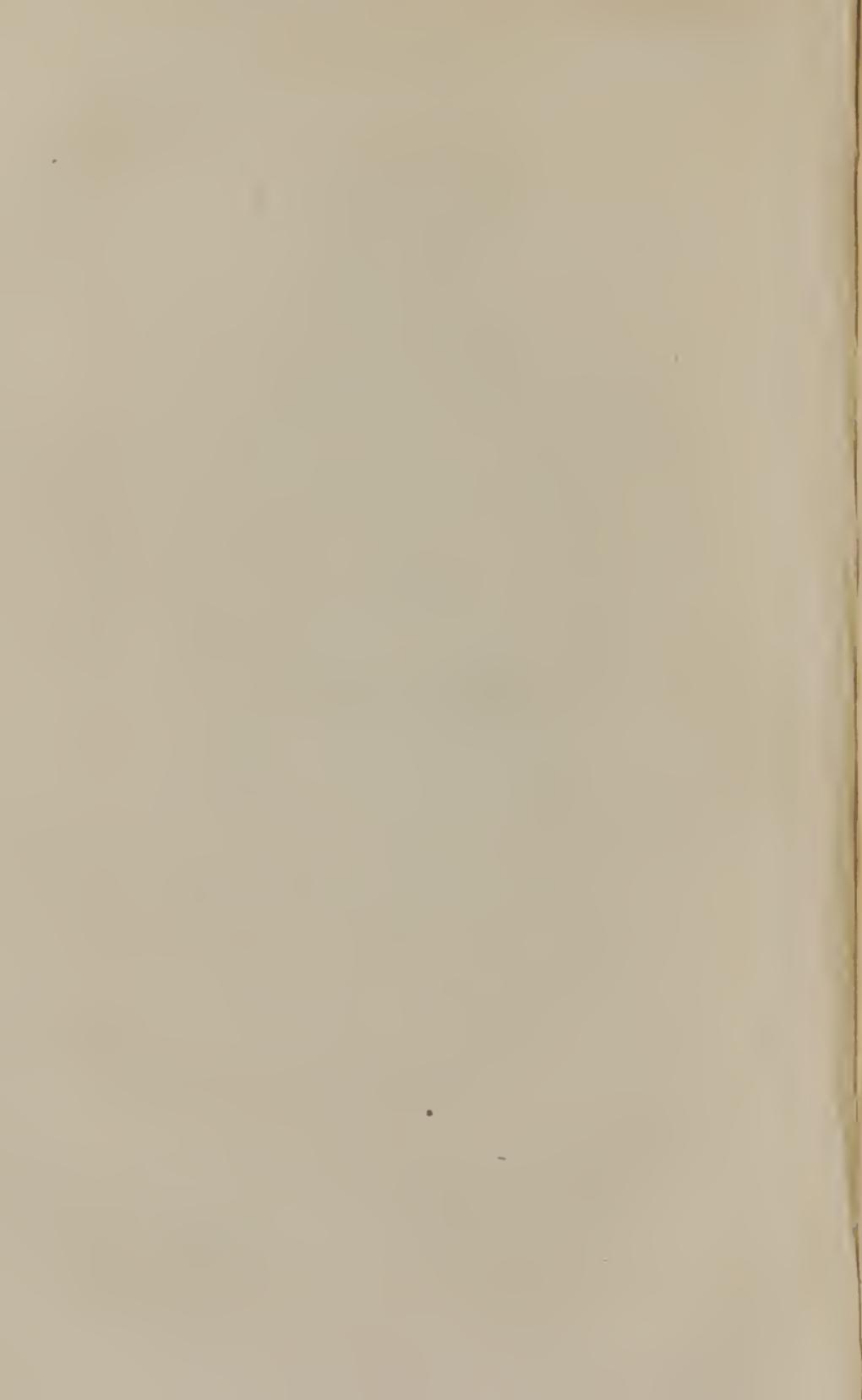
PLATE III.

ORGANS OF THE CHEST AND ABDOMEN.

THE chest and abdomen are both closed cavities, which are separated from each other by the diaphragm, a kind of muscular partition. In the figure, the front part of the body is removed so as to show the relative position of the most important internal organs of the body.

a, The trachea or windpipe, through which the air is conveyed to the lungs. *b, b, b*, The lobes of the right lung. *c, c*, The lobes of the left lung turned one side to show the heart, *d, e*, The diaphragm. *f*, The liver. *g*, The stomach, partly covered by the liver and the transverse portion of the colon. *h*, The colon or large intestine. *i, i, i*, The small intestines.





mate. And it is generally better, when relief is obtained, to remain one or two years, or return for one or two winters, than to risk the severe changes of a northern climate before the health is fully established.

Daily exercise in the open air, free use of the vocal organs, a nutritious and wholesome diet, and constant vigilance in regard to exposure to cold with insufficient clothing, may be regarded as the most hopeful means of preventing the disease. Long journeys on horseback may be resorted to with decided benefit by those who can make this kind of locomotion equally as agreeable as the rail-car or steam-boat. Exemption from this disease can be secured only by the most constant and persevering vigilance over all the habits of life, by avoiding all debilitating causes, and by using diligently those means that promote health.

CHAPTER VI.

DIGESTION AND DIET.

PROCESS OF DIGESTION—TIMES OF EATING—KIND OF FOOD—
PROPERTIES OF ALIMENTARY SUBSTANCES—DIET OF
CHILDREN—DIET OF ADULTS.

THE function of the digestive organs is to prepare the appropriate elements for the nutrition and growth of the body. Most of the food of man undergoes some process of cooking, and then of mechanical subdivision, before it is received into the digestive apparatus. The first process of digestion, consists in its further mechanical subdivision by chewing or mastication. In the act of mastication, it becomes mixed with saliva, the natural secretion of the glands of the mouth. The solubility of the food is influenced to a great extent by the perfection of this process. If it is thoroughly mingled with the saliva, the second process is performed with more facility; but if the food is swallowed very rapidly, salivation is imperfectly per-

formed, and the process of digestion is more difficult. Americans, it is said, eat faster, if not more, than the citizens of any other nation. This is unquestionably true of most persons who eat at hotels and boarding-houses, and who are engaged in active employments. The bounties of the table are no where more abundant among all classes than in the United States; and the pressure of business excitement is no where more intense and more universal, than here. Artisans, manufacturers, and tradesmen, hurry through their meals in the least possible amount of time, just as though every minute at the table was lost, or used to no good purpose. In private families, and by men not devoted to some absorbing occupation, there is a more reasonable time devoted to supply the body with the nutriment it requires. The shortest time that should ever be allowed for a full meal is thirty minutes. Those who allow themselves a much shorter time for their meals, may expect ultimately to suffer from impaired health. Dyspepsia or indigestion will sooner or later follow the habit of rapid eating.

THE TIMES OF EATING.

When the meal is finished, the stomach should remain undisturbed till the process of digestion is completed. The interval proper to be observed between the meals, depends on circumstances. In the adult, the healthy stomach requires from one to three or four hours for the process of digestion. Some kinds of food are digested much quicker than others; but hunger, or the desire for more food, is not usually experienced till some time after the stomach has disposed of its contents. If fresh food is received into the stomach before that of the previous meal has been digested, the process of digestion is disturbed. In this country, where the meals are composed of a mixed diet, from five to six hours is the proper interval to be observed. In children, all the functions are much more active, and they accordingly require nourishment more

frequently. For children under seven years of age, about three hours is an average time of rest between the meals. Infants sometimes seem to need food as often as every two hours; while older children can often wait four, without inconvenience. Eating oftener than this, is decidedly injurious.

The practice of allowing children fruit, candies, cake, &c., at any or at all hours, is always pernicious, and productive of evil. Such children are seldom healthy, and never pleasant and agreeable in their disposition. If they must be indulged in luxuries of this sort, let it be at regular hours. All the processes of digestion and absorption are carried on according to uniform systematic laws. Any interference with the processes of nature disturbs the whole economy. Irregular feeding not only disturbs and interferes with digestion, but it is a source of unpleasant and injurious irritation to the nervous system. We have often observed that clerks in grocery stores, who are allowed to be constantly nibbling at all sorts of articles, very soon become dyspeptic, or uneasy and restless in their habits, and ill-natured in their dispositions. A druggist, also, who contracts the habit of tasting every prescription of medicine which he puts up, will very soon destroy the tone of his stomach, and will require a special prescription for himself. Children who must have candy or sugar to keep them in good humor by day, will require an opiate to keep them asleep at night.

The true rule for the number and intervals of our meals, is "to proportion them to the real wants of the system, as modified by age, sex, health, and manner of life, and as indicated by the true returns of appetite." The frequency with which different animals require their food bears a very close proportion to the frequency of their respiration; and, in the case of man, this proportion will also apply. Persons who take much exercise in the open air, and whose respiration is thereby accelerated, require food, and have a proper appetite for it, much oftener than those

who are indolent and sedentary. On the same principle, birds, whose respiration is very rapid, will die of starvation in three days; while a serpent will live without food as many months. Carnivorous animals, such as the lion, tiger, cat, &c., thrive the best with only one meal a day, and their health will suffer if they are fed oftener. The law of health and of nature is, that the meals should be at regular intervals, and at about the same hour on each successive day. The number of the meals should be proportioned to the wants and circumstances of the individual.

Breakfast should always be at an early hour, and soon after rising. It is well known that the system is more susceptible of infection, miasma, and other causes of contagious or epidemic diseases, in the morning, than at any other hour of the day; unless, perhaps, when the system has been exhausted by fatigue. Naval and military commanders have found, by experience, that, in unhealthy climates, sailors and soldiers are much less susceptible to noxious influences after they have been fortified by a comfortable breakfast. In countries where ague prevails, the proportion of sick among those who are exposed before taking nourishment, is infinitely greater than among those who have breakfasted before exposure. In children, or in persons who are at all delicate, much exercise in the morning, before eating, produces exhaustion and languor, and often unfits the stomach for receiving and digesting food properly.

The advice sometimes given to invalids, to take a long walk or ride before breakfast, is not in accordance with the principles of Physiology, or the teachings of experience. Still, there are some persons who not only appear to suffer no injury from active exercise before breakfast, but are apparently benefited by it. Although many persons who have been accustomed to much active exercise in the morning, before eating, enjoy excellent health, yet it is in spite of the morning exercise, not in consequence of it. During sleep, at night, the absorbents become com-

paratively quiet and inactive, but commence their operations with renewed vigor as soon as the other powers are fairly awake, and an almost immediate demand for a fresh supply of nutriment is felt throughout the whole system. When this demand is not satisfied, prostration of the nervous energy of the digestive organs very soon follows, with sympathetic exhaustion of all the powers. We are acquainted with an enterprising farmer, possessed of what is sometimes called "an iron constitution," who has been the means of ruining the health of six sons in succession, by requiring them to work several hours before breakfast, under the delusive idea that in this way they would be strengthened and invigorated. There can be no objection, however, to early rising, provided it be followed by an early breakfast. Indeed, "early to bed and early to rise," is unquestionably the best practice for the preservation of health, under ordinary circumstances.

The natural dinner-hour is from twelve to one, and is the hour most commonly observed by the laboring classes. But the business and customs of society in the cities, have established a later hour. Men whose places of business are at a considerable distance from their residences, find it more agreeable to postpone the hour of dining till such a time as they can return to their families, and then enjoy the principal meal of the day in leisure and quiet. Under such circumstances, a late dinner is much better than a hurried meal, in the midst of the business excitement of the day, at some public table. When the dinner-hour occurs more than six hours after breakfast, a luncheon is admissible, though it should be a very light meal, designed to allay the cravings of nature, but not wholly destroy the appetite. Otherwise a luncheon should not be indulged in, except by children and those who take active exercise in the open air. Children under four years of age, imperatively require some nourishment between the hours of meals, but it should invariably be taken at about the same hour every day.

The dinner, as it is the principal meal, should occupy a longer time than is allotted to the other meals, and should be followed by at least one hour's rest from any active exertion. Gentle exercise or light reading, may be indulged in soon after dinner. Any thing which requires very much muscular or intellectual efforts, has a tendency to retard digestion by diverting the nervous energy from this process.

The supper should invariably be a light meal, taken at least two or more hours before retiring to bed, except in special cases. If a person has been obliged to undergo unusual exposure, or severe labor in the evening, and has become truly hungry, some light nourishment is proper, even just before bed-time, since an empty stomach will sometimes prove a most disagreeable preventive of sleep. But the indulgence of the appetite in late suppers, is one of the worst kinds of dissipation—a practice most pernicious to health, and a fruitful source of disease.

KIND OF FOOD.

The kind of food proper for each individual must of necessity depend on as great a variety of circumstances as there are conditions of life. The climate, the season of the year, the age, the temperament, the occupation, and the habits of life—all require certain modifications of diet. If we examine the structure of the human body at different ages, and in different individuals, we shall observe marked difference in the relative proportions of the elements of which it is composed. In the man of mature years, the muscular system predominates, and the body is remarkable for the compactness of its fibre, which adapts it for feats of strength and activity. In the child, the fluids are most abundant, producing a full, soft, and rounded form. In advanced age, the soft tissues have greatly diminished, and the whole frame is dry and wasted. So, in different individuals of the same age, we observe dissimilarity of structure quite as conspicuous. One possesses large and

powerful muscles, by which he is enabled to perform great physical labor; another has a "lean and hungry look," his muscles are smaller and weaker, and he pursues the sedentary life of a student; another has an excess of the lymphatic system, and is "fat and sleek headed," and is only fitted for a life of comfort and ease. In short, there are almost as many different developments of the various tissues as there are individuals. The young, the aged—the laborer, the idler, the man of ease, and the student—each requires a diet adapted to his own peculiarities. The same is true of all the various grades and classes of men; and they can no more exchange diet with each other, than the young and the aged can exchange habits and feelings. Modifications of diet are not less required by residence in different climates. The inhabitants of the Polar regions live, to a great extent, upon that kind of food which is called calorific or heat-producing, such as animal fats and oils. On the other hand, those of the tropical regions abstain almost entirely from such articles, and confine themselves to fruits and vegetables. It would be impossible to live, in Hindostan, on the seal-fat and whale-oil of the Greenlander; or, in Greenland, on the plantain and rice of the Hindoo. The same principle should govern, and does govern, to a great degree, the diet of the inhabitants of temperate countries. In winter, we eat larger quantities of meat than in summer; and in summer, more fruit and vegetables than in winter. No person could, in summer, indulge in the same diet which would be highly conducive to health in winter, without overloading the system with carbonaceous matter, and inducing congestive and inflammatory diseases.

PROPERTIES OF ALIMENTARY SUBSTANCES.

Different substances are nutritious in proportion as they yield, when digested, those elements which are found to exist in the various tissues of the body. Animals do not possess the power of forming new elements, or of convert-

ing one element into another, and it necessarily follows that the elements of their growth and nutrition must be derived from the food which they take. The largest part of nearly all the substances which make up the human body, are composed of oxygen, hydrogen, nitrogen and carbon, and different substances are regarded as nutritious in proportion as they furnish these essential elements of all animal organization. In general, those substances may be regarded as the most valuable articles of diet which furnish, with the greatest facility of digestion, the largest amount of these elements.

The most important animal compounds, or proximate principles, as they are called, are fibrin, albumen, gelatin, casein, and oil or fat. The composition of each of which is as follows:*

	Carbon.	Hydrogen.	Nitrogen.	Oxygen.
Fibrin,	53·019	6·828	15·462	24·691
Albumen,	53·960	7·052	15·696	23·292
Gelatin,	50·048	6·477	18·350	25·125
Casein,	52·53	7·82	16·20	22·45
Oil,	77·	11·481	10·828	

Fibrin is found in the blood, and is the principal part of the flesh or lean meat of animals. It is highly nutritious, and easy of digestion.

Albumen constitutes the most important part of animal food. It exists in the liquid state in the white of eggs, and in the serum or watery portion of blood. When raw or lightly boiled, it is nutritious, and easy of digestion; but when hard boiled, or, especially when fried, it is difficult of digestion.

Gelatin exists in large proportion in the tendons, cartilage, gristle, bones, and the membranes which invest the limbs and the muscles separately. Gelatin is known in common as glue, and forms the various animal jellies; for animal broths and soups owe their nutritious properties

* The above, and all of the remaining tables given in this chapter, together with the quotations not otherwise acknowledged, are from the valuable works of PEREIRA on "Therapeutics" and on "Food and Diet."

principally to gelatin. It is eminently nutritious, and easy of digestion when properly prepared.

Casein is the coagulable portion of milk, and constitutes the chief bulk of cheese, though the richest qualities of cheese contain considerable butter. When nearly pure, Casein is nutritious and moderately easy of digestion; but when mixed with butter, in the form of cheese, it is more or less indigestible, and is apt to disagree with weak stomachs.

Animal oil, or fat, is distributed in various portions of the body, and interposed between the tissues. In many animals it is accumulated in large quantities along each side of the back, and is then called lard, suet, tallow, &c. Animal fat, in whatever form it exists, is composed mainly of carbon, and is highly useful as an element for the promotion of animal heat. When taken alone, or in rich gravies, animal fat is difficult of digestion, except by the strongest stomachs.

Milk is regarded, perhaps correctly, as the simplest and plainest kind of food. Unlike almost any other article of diet, it embraces all the necessary elements for the nutrition of the body, and contains these elements in a form peculiarly adapted to the young of all the mammalia. Perhaps no one article of food is more widely diffused among all races of men than this. The Laplander, within the Polar Circle, is provided with milk as an important part of his diet by the reindeer. The Arabs, in the burning desert of the tropics, obtain this nutriment from their camels, their sheep, and sometimes from their goats. In all civilized countries, the cow is to be found—in the densely populated cities, and by the log-cabin of the pioneer. Cow's milk is composed of—

Casein,	4·48
Butter,	3·13
Sugar of Milk,	4·77
Various Salts,	.60
Water,	87·00

Milk, being furnished by nature as the only food for the young of the mammalia during a certain period of their existence, contains all the elements necessary for the nutrition and growth of the body. "Out of the casein are formed the albumen and fibrin of the blood. The butter serves for the formation of fat, and contributes, with the sugar, to support animal heat by yielding carbon and hydrogen to be burnt in' the lungs. The earthy salts (phosphate of lime, &c.) are necessary for the development of the bones. The iron is required for the blood-corpuscles and the hair." Milk is a highly useful and valuable article of food, as well for the adult as the child—for healthy individuals, as for invalids and convalescents.

Milk, while it possesses all the elements of nutrition in a form well adapted to the wants of the human system, may be regarded as less stimulating than almost any other diet. In chronic maladies, when it is desirable to nourish the body without stimulating unduly any particular organ, it is entitled to a preference. That it is the diet especially designed by nature for children during the first two years, hardly requires the testimony of medical authority.

Most children thrive better on it, and are less liable to derangements of the digestive organs, than on a more stimulating diet. Milk which yields a large amount of butter, sometimes proves heavy, and difficult of digestion for adults. Milk which has stood ten or twelve hours, and been skimmed, will usually answer with such persons perfectly well. In some cases, the addition of a very little arrow-root or rice, will increase its digestibility.

An almost endless variety of food is furnished to man by the numerous genera and species of fish. Among some nations, it constitutes the major portion of their diet. Fish are less nourishing and less satisfying to the appetite than the flesh of either birds or the mammalia. Those kinds of fish which abound in oil, as salmon and eels, are more nourishing, but less digestible than haddock, sole, flounder, cod or turbot.

The digestibility of fish is very much diminished by the process of salting, smoking, and drying. - The watery portion is thereby diminished, causing a larger amount of nutritive matter to be taken in proportion to the bulk. A fish diet is less substantial than either butcher's meat or poultry. It may be employed when the digestive organs are unable to assimilate stronger kinds of aliment, when it is necessary to avoid the stimulus which butcher's meat communicates to the system. Fish is better adapted to the wants of the system during the warm season than the cold; since the flesh of the more digestible kinds is less stimulating, and contains a smaller proportion of carbonaceous or heat-producing elements. The quantity of nutritive matter found in some kinds of fish has been stated as follows:—

100 parts of Muscle.	Water.	Albumen or Fibrin.	Gelatin.	Total of Nutritive Matter.
Cod, . . .	79	14	7	21
Haddock, . .	72	13	5	18
Sole, . . .	79	15	6	21

Oysters hold a high rank as a delicious and favorite article of food, which is easily digested by most persons, though they unquestionably disagree with some constitutions. They are more easily digested when raw than when cooked, according to the experiments of Dr. Beaumont.

DIGESTIBILITY OF OYSTERS.	H.	M.
Raw,	2	55
Roasted,	3	15
Stewed,	3	30

During the warmest weather, fish and oysters are both unsafe articles of diet unless used very soon after they are removed from the water. But for those who are favored either with a temporary or a permanent residence on the sea-shore, both may be regarded as a highly useful and agreeable diet.

Lobsters, though highly esteemed by epicures, are very difficult of digestion, and not to be included in the list of articles proper to be indulged in by those who prefer health to the gratification of appetite.

In this country meat constitutes an important part of the diet of almost every family. As a general rule, animal food is more easily digested, contains a greater quantity of nutriment, and is more stimulating than any of the varieties of vegetable food. The following is the composition of the kinds of meat in most general use.

100 parts of Muscle.	Water.	Albumen or Fibrin.	Gelatin.	Total of Nutritive Matter.
Beef, . . .	74	20	6	26
Veal, . . .	75	19	6	25
Mutton, . . .	71	22	7	29
Pork, . . .	76	19	5	24
Chicken, . . .	73	20	7	27

As minuteness of division and tenderness of fibre facilitate digestion, young meats are more tender than old. Thus, roasted pig, according to Dr. Beaumont's experiments, was more speedily digested than broiled pork; steak and boiled lamb, sooner than boiled mutton. Still, there are some exceptions to the digestibility of young meats. Veal, and, with some persons, lamb, are slower of digestion than beef and mutton.

DIGESTIBILITY OF MEATS.

ARTICLES OF DIET.	PREPARATION.	H.	M.
Venison-steak,	Broiled,	1	35
Pig, sucking,	Roasted,	2	30
Lamb, fresh,	Broiled,	2	30
Beef, with salt only,	Boiled,	2	45
" fresh, lean, rare,	Roasted,	3	0
" steak,	Broiled,	3	0
Pork, recently salted,	Raw,	3	0
" " "	Stewed,	3	0
Mutton, fresh,	Broiled,	3	0
" " "	Boiled,	3	0
Pork, recently salted,	Broiled,	3	15
Pork-steak,	Broiled,	3	15
Mutton, fresh,	Roasted,	3	15
Beef, fresh, lean, dry,	Roasted,	3	30
" with mustard, &c.,	Boiled,	3	30
" " "	Fried,	4	0
Veal, fresh	Broiled,	4	0
Beef, old, hard, salted,	Boiled,	4	15
Pork, recently salted,	Fried,	4	15
Veal, fresh,	Fried,	4	30
Pork, fat and lean,	Roasted,	5	15

According to the preceding table, the time required for the digestion of beef and mutton is the same. Dr. Bell is fully persuaded that beef is not as digestible as mutton. Others seem to consider beef as the most digestible. With some invalids, we have found beef to agree best, and with others mutton. But beef is unquestionably more nourishing and more stimulating than mutton, and will enable a person who eats it freely to bear more fatigue and display more strength than if he were to eat mutton.

Pork is more difficult of digestion than beef or mutton, though salt pork and bacon are less likely to disagree with weak stomachs than fresh pork.

Chicken flesh is nutritious and easily digested, and is perhaps the least stimulating of animal foods, and often agrees with the stomach when other meats do not.

The vegetable kingdom greatly exceeds the animal in the number and variety of the aliments which it furnishes to man. The chief nutritive principles in vegetables are gluten, starch, sugar, gum and oil. The alimentary qualities of different kinds of vegetable food will be found to depend on the quantity and the proportions in which these principles exist. The composition of each of these principles is given in the following table:

	Carbon.	Hydrogen.	Oxygen.	Nitrogen.	Water.
Gluten,	55.22	7.42	21.38	15.08	
Starch,	37.5				62.5
Sugar,	42.85				57.15
Gum,	36.3		10.828		63.7
Oil,	77.403	11.481		2.888	

It will be seen by the above table that the four essential elements, Carbon, Hydrogen, Oxygen, and Nitrogen, which form an important part of all animal compounds, are also to be found in great abundance in vegetable compounds. It is owing to this fact that different animals are nourished equally well on an exclusive diet of either. The lion, tiger, and other animals which live exclusively on animal food, give no evidence of being better nour-

ished than the deer, the ox, and those animals which subsist wholly on vegetable food. But the apparatus for digestion in each class is constructed with an evident adaptation to the kind of diet on which the different animals subsist. Those animals which live on vegetable aliment are provided with organs more complicated than those which subsist on the flesh of other animals. In man, the digestive apparatus is more extensive than in flesh-eating animals, but is less complicated than in those which are confined to vegetable food alone. Man is therefore omnivorous, both in his structure and in his habits.

Instances are not wanting, however, in which men have lived in the apparent enjoyment of health on an exclusive diet of each. Thus, Sir Francis Head states in regard to the Guachos, inhabitants of the Pampas in South America, "that they often continue on horseback day after day, galloping over their boundless plains, under a burning sun, and performing labors almost of an incredible description. The constant food of the Guachos is beef and water. His constitution is so strong that he is able to endure great fatigue, and the distances he will ride, and the number of hours he will remain on horseback, would hardly be credited." The inhabitants of India and most tropical countries subsist almost entirely on a vegetable diet.

But the universal tendency of mankind gives preference to a mixed diet. The most perfect physical development and the greatest intellectual vigor are to be found among those races in which a mixed diet is the prevalent habit.

Wheat is justly regarded as superior to all other kinds of grain in its nutritive qualities, which are owing to the large amount of gluten it contains. Wheat flour forms the first, the whitest, and most digestible bread. The unbolted flour, containing the bran, is highly recommended for the use of dyspeptics. When bread is the principal food, it is more readily digested than the bread

made from bolted flour, which is apt to form a cohesive mass after imperfect mastication. Bran-bread is also useful in obviating constipation of the bowels. "Oats are nutritive, but less so than wheat. Oat-meal is especially the food of the people of Scotland, and was formerly that of the northern parts of England, countries which have always produced as healthy and vigorous a race of men as any other in Europe. Unfermented oat-bread, in those unaccustomed to it, is apt to occasion dyspepsia, with heart-burn, and was formerly thought to have a tendency to cause skin diseases, but without just grounds. Gruel is a mild, nutritious, and easily digested article of food, in fevers and inflammatory affections. It is well adapted for irritable conditions of the stomach."

Barley, when deprived of the husk, (which is slightly acrid and laxative) is highly nutritious. Count Rumford regards barley-meal, when used for soup, as three or four times as nutritious as wheat flour. Barley-bread is said to be more difficult of digestion than wheaten-bread. Barley-water is a mild, easily-digestible liquid.

Rye is nutritive, but less so than wheat. In those unaccustomed to it, rye bread is apt to occasion diarrhea, which Cullen ascribes to its readily becoming acescent.

Rice is the ordinary sustenance of many oriental nations. Being less laxative than the other cereal grains, it is frequently prescribed by medical men as a light, digestible, uninjurious article of food in diarrhea and dysentery; and in consequence it is with the public a reputed drying and astringent agent.

Maize, or Indian corn, is extensively used for human existence, and is a wholesome and nutritious aliment; but with those who are unaccustomed to its use, it is apt to produce diarrhea, in consequence, probably, of the presence of the husk, with which it is always more or less mixed in the state in which it is brought to market. It is on this account that it has been regarded as a bread but little adapted for those liable to or laboring under bowel affec-

tions, or in times when a predisposition to cholera exists. The young grains, constituting the "roasting ears," make a delicious vegetable, ready for the table, too, after the season for green peas has gone by. When very young, corn in this state is in its most digestible condition, the husk being comparatively tender; but when old, a considerable part of the grain withstands the digestive operations, and passes through the bowels unchanged. It need hardly, therefore, be added, that where bowel affections are rife, this vegetable ought to be used with caution.

Peas and beans are nutritious, but they are apt to disturb the digestive organs, and to occasion flatulence and colic. Their difficult digestibility increases with their age. When young, they are less nourishing, but more digestible. They are usually regarded as being somewhat stimulating and heating, and therefore not adapted for febrile and inflammatory affections.

"The chestnut possesses considerable nutritive power, and in Lombardy is used as food by the lower classes. Its sweetness, especially when roasted, indicates the presence of sugar. No oil can be obtained from it by pressure. In the raw state, it is very difficult of digestion. It requires to be cooked (roasted) to split the starch grains which it contains, and thereby to render them readily digestible. Dyspeptics should carefully avoid chestnuts, even in the cooked state."

"The potato, when properly cooked and in good condition, furnishes a highly nutritious and easily digestible food. In this country, potatoes are cultivated to a great extent, and form a regular part of the daily food of a vast majority of the inhabitants. In Ireland, they constitute from two-thirds to four-fifths of the entire food of the people. Potatoes are more palatable and nutritive when boiled, so as to make them moderately soft, though not to injure their shape; but they are more digestible when boiled so as to be easily mashed. Waxy and new potatoes are less digestible than old mealy ones."

Turnips are in general easily digested, though they are but very slightly nutritive—over ninety parts in a hundred being water. Melons, though but slightly nutritious, are an exceedingly grateful and refreshing luxury during warm weather. They should not be indulged in during the evening, especially just before retiring to bed. As a dessert, in the morning or after dinner, they are wholesome, and will seldom prove injurious, unless indulged in to excess.

The cucumber, which is usually eaten with condiments—such as pepper, salt and vinegar, or in the pickled state—is very slow and difficult of digestion, and has but little to recommend its use, except the mere gratification of the appetite. In some countries, however, it is stewed with other articles, and is then a light and wholesome food, though but slightly nutritious.

The various oily seeds—as the walnut, the hazle-nut, the butter-nut, and the filbert—contain a quantity of fixed oil, which renders them very difficult of digestion.

The peach, nectarine, apricot, plum, and cherry, are the principal stone-fruits in this country. They are all slightly nutritious, and are usually regarded as difficult of digestion. But this popular opinion is probably owing more to the results of excessive indulgence than to any noxious properties which these highly delicious fruits possess. When fully ripe, and used in moderation at proper hours of the day, they will rarely be found to prove injurious; but, on the contrary, they are evidently adapted to the wants of the system at the season of the year when they appear. When indulged in to excess, or at irregular hours, or on retiring at night, or in an unripe state, these fruits are liable to undergo an acetic fermentation, and produce diarrhea and dysentery. Cherries are the most liable to disorder the bowels, and peaches are the most harmless.

Apples and pears are very agreeable and wholesome fruits for most persons, though they are not easy of digestion with some. When imperfectly masticated, raw apples

often remain in the stomach for a long time—in some instances, a day or two. Roasted apples are much easier of digestion than raw, and are often used to promote relaxation of the bowels. Dr. Bell remarks, that "the apple, containing both malic and citric acids, with some sugar, has a pleasant and refreshing flavor, and, to persons in health, constitutes a useful addition to bread or other farinaceous food. It is inimical to the dyspeptic, the rheumatic, the gouty, and those troubled with renal and cutaneous disorders." It is often a source of serious—sometimes fatal—disease in children who have not masticated the fruit sufficiently, but swallowed it in pieces of some size. Subjected to various changes by roasting, baking and stewing, and the addition of sugar, apples acquire more nutritive value; and when eaten, as they often are, with milk or cream and bread, may be regarded as furnishing a meal equal to the subsequent requirements of active exercise, if not of labor.

Grapes may be included among our most valuable and esteemed fruits. When fresh, they are wholesome, nutritious and refreshing; and when taken freely, diarrhetic and laxative. The skins and seeds are indigestible, and should not be received into the stomach.

The strawberry and raspberry, the whortleberry and blackberry, are each most delicious and highly-esteemed fruits, and rarely prove injurious, except from excessive indulgence, or from the cream and sugar that is taken with them.

The various fruits which come to perfection during the summer and early fall, are unquestionably designed to take the place, in part, of more hearty and solid food, at a season of the year when the health is exceedingly liable to suffer from accumulation of carbonaceous matter in the blood. Most of the diseases of August and September have their origin, in a greater or less degree, in an excess of bile in the system.

DRINKS.

Water, in some form, is more essential to our existence than any of the solid aliments we have considered, and is next in importance to the performance of the vital processes, to the air we breathe. Water enters into the formation of all the various tissues of the body, and constitutes a very large proportion of the human system. The blood contains about eighty per cent.; the flesh about seventy-six per cent. of water; and of the entire human body at least seventy-five per cent., or three-fourths of its weight, is water. The most important purposes in the animal economy, are accomplished through this medium. In the blood, the solid vital elements are transported by the medium of water from one part of the body to another in a form and condition to promote the vital changes which are constantly taking place. In exhalation, secretion, and absorption, the presence of water is indispensable. It acts as a solvent of various alimentary substances, and thus assists the stomach in the act of digestion; though, when taken in large quantities immediately after eating, it dilutes the gastric juice, and hinders digestion. Water enters more or less largely into the composition of all alimentary substances, and is taken into the stomach in a pure state, or forms the principal part of the various kinds of drinks in use.

Water is unquestionably the natural drink of adults, and meets the wants of the body more perfectly than any or all of the artificial liquids which are regarded as improvements on the simple drink Nature has designed and universally provided for man and beast in all parts of the earth. Whenever man is left to the cravings of instinct, unbiased by a vicious appetite, he invariably resorts to water as the natural means to quench his thirst, cool his system, and invigorate his wasting strength. "Next to the nutritive fluid furnished by the maternal bosom, water is the one taken with avidity by the infant, as, if left to his

primitive taste, it ever would be by adult men; and even he who, in the madness of his evening revel, drinks deep of the intoxicating bowl, and stoutly denies the fitness of water as a beverage, will on the following morning entreat for and clasp with eagerness the full pitcher of this liquid, which a few hours before he had so resolutely derided. Both interest and recovered reason now suggest the choice of the proper beverage; and, but for the curse of imitation and evil example, their joint influence could never be mistaken."

"When we say that water is the only fitting drink for man's daily and habitual use, we are sustained by the facts of the case. Water is the only liquid which is essential to the formation, development, and support of his frame: it is equal to all the exigencies of thirst, for the relief of present inconvenience, and of dilution, by mixing with his blood, and other fluids, to prevent farther suffering and disease. Water is found in all climates and habitable regions of the earth; and Providence has no where offered, in fountain, stream or well, in river or in lake, any liquid as a substitute for water. To be the universal beverage, it ought to be, as it is, every where attainable, and adequate to all our natural wants,—of appetite, growth, bodily and mental exercise, and activity. Even when the health suffers, and the body and mind are ill at ease, where is the restorative liquid or agent of any kind which can revive and renovate like water,—whether taken alone, in its purity, or with some slight saline and mineral impregnation! It is the beneficent menstruum and conductor of medicinal matter into the blood; and even when they are refused entrance, it readily finds its way, and not seldom accomplishes the cure for which they are lauded."

In fevers and inflammatory diseases, water quenches the stimulating quality of the blood, increases its aqueous part, promotes the action of the secreting organs, and is a most efficient means for reducing the fever and allaying the burning heat.

A great variety of articles have been employed with the view of making water more agreeable to the palate and of allaying thirst. The most useful of these are the acids which are obtained from various kinds of fruit. Lemonade justly ranks foremost among the acid drinks. The jellies of currants, cranberries &c., are very agreeable additions to water, and are not injurious. Simple sacharine drinks, such as sugar and water or molasses and water with the addition of a small quantity of vinegar, will relieve thirst, and be relished by some persons. Thirst may also be allayed by the application of water to the cutaneous surface. Sailors, when deprived of fresh water for drinking purposes, are relieved from thirst by bathing themselves or wetting their clothes in salt water. The thirst of fever patients may often be relieved more effectually by frequent sponging of the surface with tepid water than by taking water into the stomach.

Alcoholic drinks have so long been a theme of public lectures and discussion that a lengthy account of them would hardly seem necessary in a work like this. Yet a few facts in regard to the physiological effects of alcoholic liquors may not be amiss. Alcohol, whether found in rum, gin, brandy, or wine, or in any other intoxicating drink, is a poison to the human system as truly as arsenic, nux vomica or opium.

Alcoholic or intoxicating drinks, though used from the remotest ages, are nevertheless found to be injurious and pernicious in their influence. Whether contained in rum, gin, brandy, or wine, alcohol is known to be a poison to the human system. As a local application, it has the effect of a powerful irritant and caustic poison, causing contraction and condensation of the tissues, and producing pain, heat, redness, and increased determination of blood to the part. These symptoms may go on, increasing in severity, till actual destruction of the tissue to which it is applied may ensue.

In the act of swallowing, it produces a burning, scalding

sensation on the mucous membrane of the throat. When alcohol is introduced into the stomach, it is not digested like nutritive matter, but passes directly into the veins by absorption. It is thence conveyed to the lungs and heart, and thence through the general circulation to every part of the body, escaping as fast as nature can get rid of it through the lungs, liver, kidneys and skin. Under its habitual use, the mucous membrane of the stomach passes through the successive stages of irritation, inflammation and gangrene. The blood-vessels through which the poison circulates become permanently enlarged, producing the characteristic red and bloated face of the inebriate. The liver and kidneys, which labor to convey it out of the system, become enlarged in size and softened in texture, and the skin breaks out in deep red blotches, in boils, or excoriating ulcers. On the brain, alcoholic liquors act as a stimulant, even in the smallest doses; but when taken habitually, or in large doses, it acts as a poison, changing not only the character of the mental phenomena, but making an impression on the structure of the organ itself. Throughout all of these organs, alcoholic drinks leave most unequivocal traces of their poisonous character. In extreme cases of exhaustion of the nervous energy, by fatigue, hunger, or sickness, they are highly useful as temporary stimulants, but they possess no qualities which recommend them as appropriate beverages for persons in health. The views of medical men in regard to their use may be learned from the following certificate, signed by upwards of two thousand English physicians:*

"We, the undersigned, are of opinion—

"1. That a very large proportion of human misery, including poverty, disease, and crime, is induced by the use of Aleoholie or fermented liquors as beverages.

"2. That the most perfect health is compatible with Total Abstinence from all such intoxicating beverages, whether in the form of ardent spirits, or as wine, beer, ale, porter, cider, &c. &c.

* Carpenter on Alcoholic Liquids.

"3. That persons accustomed to such drinks may, with perfect safety, discontinue them entirely, either at once or gradually, after a short time.

"4. That Total and Universal Abstinence from Alcoholic beverages of all sorts would greatly contribute to the health, the prosperity, the morality, and the happiness of the human race."

NUTRITIVE VALUE OF ALIMENTS.

The comparative nutritive value of different kinds of aliments may be learned by the following table, which gives the per centage and quantities of dry matter contained in the most common articles of food:

TABLE,

Representing the average quantities of Dry Matter, Moisture, Carbon, and Nitrogen in various alimentary substances, as ascertained by analysis.

100 PARTS.	Solid or Dry Matter.	Water or Moisture.	Carbon.	Nitrogen.
Gum Arabic,	87·6	12·4	36·3	0
Ditto,	82·4	17·6	34·78	0·14
Sugar Candy,	89·47	10·53	42·09	0
Ditto			42·85	0
English refined sugar, . . . . .	..	..	{ 41·5 to 42·5 }	{ 0 }
Maple sugar,			42·1	0
Beet-root sugar,			42·1	0
East India moist sugar,			40·88	0
Sugar of Narbonne honey,			36·36	0
Sugar from starch [Potato sugar?]			36·2	0
Sugar of milk,			40·0	0
Ditto (crystalized)	87·5	12·5	40·46	0
Manna sugar (<i>Mannite</i>)			38·7	0
Ditto			39·85	0
Potato starch (commercially dried)	82	18	36·44	0
Fine Wheat starch,	85·2	14·8	37·5	0
Arrow-root,	81·8	18·2	36·4	0
Almond oil,	100	0	77·403	0·288
Olive oil,	100	0	77·50	0
Butter,*	100	0	65·6	0
Hog's lard,	100	0	79·098	0
Mutton suet,	100	0	78·996	0
Wheat,	85·5	14·5	39·415	1·966
Rye,	83·4	16·6	38·530	1·417
Oats,	79·2	20·8	40·154	1·742
Oatmeal,	93·4	6·6		

* Butter usually contains about one-sixth of its weight of buttermilk.

	100 PARTS.	Solid or Dry Matter.	Water or Moisture.	Carbon.	Nitrogen.
Bread (Rye)	average . . .	67.79	32.21	30.674	
Ditto	ditto . . .			30.15	
Leguminous seeds	ditto . . .			37.00	
Peas,		84.0	16.0	35.743	
Ditto (<i>Pois jaunes</i>)	. . . . .	91.4	8.6	42.4	3.838
Ditto		85.94	14.06		
Beans,		85.89	14.11	38.24	
Ditto (<i>Broad or Windsor Bean</i>),		84.37	15.63		
Lentils,		84.1	15.9	37.38	
Potatoes,		24.1	75.9	10.604	0.3615
Ditto (fresh)		20.6	79.4		0.37
Ditto (fresh)				12.2	
Ditto (kept 10 months,)		23.2	76.8		
Cabbage,		7.7	92.3		0.28
Turnips,		7.5	92.5	3.2175	0.1275
Carrots,		12.4	87.6		0.30
Jerusalem Artichoke,		20.8	79.2	9.0	0.3328
Apricot (ripe,)		25.13	74.87		
Greengage (ripe,)		28.90	71.10		
Peach (ripe,)		19.76	80.24		
Cherries (ripe,)		25.15	74.85		
Pear (ripe Jargonelle,)		16.12	83.88		
Gooseberries (ripe,)		18.90	81.10		
Smyrna Figs,		84.00	16.00		
Cucumber (peeled)		2.86	97.14		
Blood,		20.00	80.00	10.392	3.014
Milk, Cows,		12.98	87.02	..	..
" Ass's,		8.35	91.65	..	..
" Woman's,		12.02	87.98	..	..
" Goat's		13.20	86.80	..	..
" Ewe's		14.38	85.62	..	..
Butcher's meat, devoid of fat, . . .	26	74		13.6	
" " with 1-7th fat and cellular tissue				21.75	
" " including bones, as purchased, . . .	29	71			
Fresh beef flesh,	25	75		12.957	3.752
Muscular flesh of Ox,	22.5	77.5			
" " Calf,	{ 20.3 to 21.8 }	{ 79.7 to 78.2 }			
" " Pigeon,	24.0	76.0			
" " Chicken,	22.7	77.3			
" " Carp and Trout (average,) . . .	19.7	80.3			

100 PARTS.	Solid or Dry matter.	Water or Moisture.	Carbon.	Nitrogen.
Muscular flesh of Cod, Haddock and Sole (average).	20·0	80·0		
Egg, white of,	20·0	80·0		
" yolk of,	46·23	53·77		
" dried and purified album. of,			55·60	15·681
Calf's sweetbread,	30·0	70·0		
Oysters,	12·6	87·4		
Isinglass,	92·5	7·5		
Beef Tea,	1·5625	98·4375		
Soup of the House of Arrest at Giessen,			0·75	

DIGESTIBILITY OF ALIMENTARY SUBSTANCES.

THE facility with which different alimentary substances are digested depends on a variety of circumstances. Some kinds of food are naturally more difficult of digestion than others. This is especially the case with all oily or fatty substances, which contain a large amount of nutritive matter in a concentrated form. Tenderness of fibre renders the digestive process more easy, and therefore all those circumstances which affect the texture of flesh have an influence on its digestibility. Violent muscular exertion immediately previous to the death of the animal renders the flesh more easy of digestion. The flesh of young animals, though more tender than that of the adult animal, is frequently not so easily digested. Of adult animals, the youngest will be found more tender and digestible than old animals. Vegetables are generally more slowly digested than meat. Minute division facilitates digestion: hence, if food is perfectly masticated, the process of digestion will be more rapid than otherwise.

The art of cooking has as much or more to do with the digestibility of food than any circumstance belonging to the food itself, or the manner in which it is received into the stomach. The immediate object which civilized nations seem to aim at in the art of cooking is, the gratification of the palate. The more important purpose of promoting digestion is quite a secondary object. Cook-

ing, for the most part, produces no chemical change in the constitution of food. It simply destroys its organization and softens its texture.

Boiling is the process best suited to facilitate digestion. It softens the fibrous texture of meat, and renders it more soluble in the gastric juice, while the oily and more indigestible portions of the meat are melted out. In the case of vegetables, boiling affects the solution of gummy and saccharine substances, and sets free the volatile oils. Roasting and broiling are both regarded as unobjectionable and next to boiling. Meat, when roasted or broiled, is more digestible when well done than when rare—provided it be not overdone. When thoroughly cooked, it contains less oil than when rare. Frying is the most objectionable of all the ordinary processes of cooking—for the reason that meat prepared in this way contains a larger amount of oil than by any other process. Eggs, omelets, pancakes, fritters, fish, livers, and other dishes cooked by frying, are difficult of digestion for weak stomachs. Butter and all fat substances when melted, set free their fixed oils, and become indigestible. Thus, drawn butter, buttered toast, butter cakes, pastry, marrow, and suet-puddings, are all difficult of digestion, and “lie heavy on the stomach.” The whole process of pastry-cooking is at war with digestion, and cannot be indulged in with impunity by persons of weak stomachs or dyspeptic habits. Articles of food that are naturally easy of digestion, when uncombined with other articles, become most obnoxious to the digestive organs by being compounded together. Thus, eggs, flour, butter, bread, and sugar, are each very wholesome, and readily digested when eaten separately; but when the eggs and butter are combined with the flour and sugar to form rich cake, the compound may almost defy the powers of the human stomach. Eggs, too, when rarely boiled, will not offend the most delicate stomachs, but when fried hard in animal fat or butter, they are exceedingly difficult of digestion by the most vigorous. All

compounds, or such as are formed by cooking several simple articles of diet in combination, are found more or less indigestible, according to the richness of the compound.

The mean time required for the digestion of different articles of diet is shown in the following table:

TABLE.*

Articles of Diet.	Preparation.	H.	M.
Beef-steak	Broiled	3	
Pork, recently salted	Raw	3	
Pork, recently salted	Stewed	3	
Mutton, fresh	Broiled	3	
Mutton, fresh	Boiled	3	
Soup, bean	Boiled	3	
Chicken soup	Boiled	3	
Aponeurosis	Boiled	3	
Dumpling, apple	Boiled	3	
Cake, corn	Baked	3	
Oysters, fresh	Roasted	3	15
Pork, recently salted	Broiled	3	15
Pork-steak	Broiled	3	15
Mutton, fresh	Roasted	3	15
Bread, corn.	Baked	3	15
Carrot, orange	Boiled	3	15
Sausage, fresh	Broiled	3	20
Flounder, fresh	Fried	3	30
Catfish, fresh	Fried	3	30
Oysters, fresh	Stewed	3	30
Beef, fresh, lean, dry	Roasted	3	30
Beef, with mustard, &c.	Boiled	3	30
Butter	Melted	3	30
Cheese, old, strong	Raw	3	30
Soup, mutton	Boiled	3	30
Oyster soup	Boiled	3	30
Bread, wheat, fresh	Baked	3	30
Turnips, flat	Boiled	3	30
Potatoes, Irish	Boiled	3	30
Eggs, fresh	Hard Boiled	3	30
Eggs, fresh	Fried	3	30
Green corn and beans	Boiled	3	45
Beets	Boiled	3	45
Salmons, salted	Boiled	4	
Beef	Fried	4	

* This table is made up from the observations of Dr. Beaumont on the process of digestion in the stomach of Alexis St. Martin.

Articles of Diet.	Preparation.	H.	M.
Veal, fresh	Broiled	4	
Fowls, domestic	Boiled	4	
Fowls, domestic	Roasted	4	
Ducks, domestic	Roasted	4	
Soup, beef, vegetables, and bread .	Boiled	4	
Heart, animal	Fried	4	
Beef, old, hard, salted	Boiled	4	15
Pork, recently salted	Fried	4	15
Soup, marrow bones	Boiled	4	15
Cartilage	Boiled	4	15
Pork, recently salted	Boiled	4	30
Veal, fresh	Fried	4	30
Ducks, wild	Roasted	4	30
Suet, mutton	Boiled	4	30
Pork, fat and lean	Roasted	5	15
Tendon	Boiled	5	30
Suet, beef, fresh	Boiled	5	30
Rice	Boiled	1	
Pigs' feet, soured	Boiled	1	
Tripe, soured	Boiled	1	
Eggs, whipped	Raw	1	30
Trout, salmon, fresh	Boiled	1	30
Trout, salmon, fresh	Fried	1	30
Soup, barley	Boiled	1	30
Apples, sweet, mellow	Raw	1	30
Venison-steak	Broiled	1	35
Brains, animal	Boiled	1	45
Sago : :	Boiled	1	45
Tapioca	Boiled	2	
Barley	Boiled	2	
Milk	Boiled	2	
Liver, beef's, fresh	Broiled	2	
Eggs, fresh	Raw	2	
Codfish, cured, dry	Boiled	2	
Apples, sour, mellow	Raw	2	
Cabbage, with vinegar	Raw	2	
Milk	Raw	2	
Eggs, fresh	Roasted	2	15
Turkey, wild	Roasted	2	18
Turkey, domestic	Boiled	2	25
Gelatine	Boiled	2	30
Turkey, domestic	Roasted	2	30
Goose, wild	Roasted	2	30
Pig, sucking	Roasted	2	30
Lamb, fresh	Broiled	2	30

Articles of Diet.	Preparation.	H.	M.
Hash, meat and vegetables	Warmed	2	30
Beans, pod	Boiled	2	30
Cake, sponge	Baked	2	30
Parsnips	Boiled	2	30
Potatoes, Irish	Roasted	2	30
Potatoes, Irish	Baked	2	30
Cabbage, head	Raw	2	30
Spinal marrow, animal	Boiled	2	40
Chicken, full grown	Fricasseed	2	45
Custard	Baked	2	45
Beef, with salt only	Boiled	2	45
Apples, sour, hard	Raw	2	50
Oysters, fresh	Raw	2	55
Eggs, fresh	Soft Boiled	3	
Bass, striped, fresh	Broiled	3	
Beef, fresh, lean, rare	Roasted	3	

The preceding table cannot be taken with full confidence of its accuracy in all cases, since the observations were made under a variety of circumstances, which might influence the length of time in some instances. The rapidity of digestion, as Dr. Beaumont himself shows, varies greatly, according to the quantity eaten, the amount and nature of the preceding meal, the state of health and of weather, and also the state of the mind.

DIET OF CHILDREN.

We have already seen that the kind of food proper for each individual depends on as great a variety of circumstances as there are conditions of life. No specifications of diet can, therefore, be made applicable to every person. There should, however, be a marked difference between the diet of children and that of adults. Previous to dentition, the only diet proper for the infant is such as nature has provided—the mother's milk. When the young infant must be deprived of this provision for its wants, through inability or disinclination of the mother, a very close approximation to its natural diet may be made from the top of cow's milk that has stood two or three hours, com-

bined with two parts of water and a small quantity of sugar. This mixture contains the same chemical elements, in nearly the same proportions, as the mother's milk. It is found to be a very safe and wholesome diet for the young infant. No other diet has been so fully authorized, either by chemical analysis, or by the observations of experience. This, or the mother's milk, is the only food that should be allowed previous to dentition; and a vast amount of infantile suffering would be saved by its rigid adoption. When the teeth begin to appear, something more is required. Farinaceous food, or such as is prepared from wheat, rice, &c., may be allowed in small quantities at first, and increased according to the child's wants. Whatever is given, should be well cooked, and not used on the same day that it is taken from the oven. The character of the food should be as uniform as possible, variety injuring rather than promoting health. Up to the appearance of the second teeth—usually about the sixth or seventh year—milk should constitute an important portion of the diet. Pastry of all kinds should be discarded. Meat is seldom required under four years of age, and should not be used freely under seven. It is more stimulating than other food, and is the cause of too much nervous excitement. Slender and feeble children sometimes require it at an earlier age. But most children enjoy better health, and are less liable to disease, without meat, unless it be given in small quantities. After the child is weaned, gruel, arrow-root, bread, crackers, rice, wheaten-grits, farina, &c., may be allowed, with a small quantity of sugar. Meat, when permitted, should not be used, except at dinner.

A great evil in the treatment of children, is over-feeding. In the infant, this is a most serious evil, and one that is productive of much suffering: giving rise to colic, bowel complaints, nervous irritability, and convulsions. Too often, the young infant is laid on its back, in the nurse's lap, and then compelled to swallow, to avoid choking, until it is literally running-over full, and cries from the

pain caused by distention of the stomach. Again and again is this inhuman process repeated, whenever the unfortunate victim gives expression to its sufferings in cries. Nature has ordained that the food of the infant should be received very slowly from the breast, and that only during the will of the child. Artificial feeding is most perfect, when it imitates nature. The food should be plain and nourishing, and should be administered at regular intervals, and at nearly the same hours daily, none being allowed at other times. The food should also be administered gradually, and the child educated to eat slowly, and masticate its food thoroughly. If the food is taken moderately, and at the will of the child, there will be but little danger of over-feeding, unless it is tempted with choice bits, after the appetite is satisfied with the regular meal.

During the cold season, sugar is a very useful article of diet, and may be allowed freely with other food, though it is not easily digested when taken alone. Candies are injurious; mainly because they are eaten at irregular hours, upon an empty stomach, or upon food that is in a process of digestion. Candy, if eaten at all, should be rather in connexion with other food, or immediately after, as dessert.

Colored candies are sometimes pernicious, from the poisonous qualities of the coloring matter employed in their manufacture, and should always be prohibited. Used properly, sugar in its various forms serves a very important purpose in furnishing carbon to maintain animal heat. But when taken alone, or in rich cakes, it is exceedingly difficult of digestion, and is as injurious as it is useful when properly administered. The opinion very generally prevails—at least among frugal house-wives—that sugar is injurious to the teeth, causing them to decay, but there is no evidence that such is the fact.

Children almost universally exhibit an instinctive fondness for sugar, and it is an important element in the mother's milk. They may require a larger proportion of

it than adults, on account of the greater activity of the respiratory functions, and a higher degree of animal heat.

During the warm season, vegetables and fruits may be made the means of great mischief or of great good. Perfectly ripe fruits and vegetables are highly useful, and well adapted to the wants of the system at this season of the year. Yet they may become, and often are, a most prolific source of disease. So frequently is this kind of food a cause of bowel complaints, that most city physicians discard it wholly from the diet of children not under their own personal supervision. Some prohibit their use to adults. Vegetables and early fruit that have been long exposed in a malarious or filthy market, or in transportation, are unquestionably dangerous articles of food for all persons. But the injurious consequences which follow the use of ripe and wholesome vegetables and fruit, are in almost all cases the results of imprudence. They are either in an improper condition to be used as food, or the quantity is too great, or it is taken at improper hours. Many families use this kind of food only occasionally, and then it forms an important part of a meal, or is indulged freely at other hours. In either case, there is a very great change from the usual diet. Instead of a lack of refrigerant and laxative food, there is now an excess of it. Active fermentation takes place in the process of digestion, and results in serious derangement of the whole alimentary canal, which leads to cholera-morbus, diarrhea, or dysentery.

During warm weather, vegetables and fruit are to be regarded as safe only when used as an accompaniment to other food. They are not adapted to meet all the wants of the system, and therefore should not constitute a full meal at any time. In the country, where this kind of food is enjoyed daily, in a proper condition to be eaten, injurious consequences are quite rare, and then they are the result of excess, or of an indulgence of the appetite at irregular hours. Children are remarkably fond of fruit,

as well as sugar, and there seems to be in their constitutions some inherent demand for these articles. No part of their diet apparently conduces more to their health and happiness, when they are allowed it at proper times, and as a portion of their daily food. But children are so prone to excessive indulgence in the various kinds of fruits, that great caution is necessary to prevent the most serious evils. Much care is also requisite to prevent imperfect mastication of this kind of food. Orange-peel, and the skins and stones of cherries, plums, and grapes; are wholly indigestible, and often cause serious mischief when swallowed.

Cucumbers, beets, green potatoes, green fruit of all sorts, should be wholly discarded from the diet of children.

DIET OF ADULTS.

THE same general rules should be observed by adults as have been laid down for children, though a much wider range of diet is allowed. Those whose habits of life lead them to take much active exercise, require a very liberal allowance of animal food; and those who labor out of doors require more than those employed in shops. Merchants and tradesmen require less; and students, or men of sedentary habits, the least of all. Adults are injured by eating at irregular hours, by eating too fast and too much, by indulging in a great variety of dishes that pamper the appetite to excess, and by food too rich and hearty for easy digestion. The art of cookery, when confined to its legitimate end, is highly useful; but it is a most mischievous and dangerous art, when it lends its service to the compounding of the fashionable lobster-salads, turtle-soups, rich cakes, &c. We have already alluded to the impropriety of late suppers. It would seem that no man of reflection, who has experienced one of those restless nights which follow a late supper, would need to be reminded that habitual indulgence in this practice wears out and deranges his most important organs, and that he is,

in fact, guilty of a slow suicide. Perhaps no class of men are more reckless in their habits of eating than the students and clergymen of this country. Not that this class of persons are pr  eminently intemperate in their indulgence of appetite, when compared with other men, but the amount of exercise and physical exertion to which they are accustomed is generally much less than that of most other men; and, therefore, the quantity of their food greatly exceeds the wants of their system. All persons who take but little exercise, should refrain from rich and hearty food of every description.

Meat may and should be eaten, but it should be mostly lean, free from rich gravies, and in small quantities. All spicy and aromatic condiments are in the end injurious to the stomach, though they act as temporary stimulants, and facilitate digestion when used; but their ultimate effect is to weaken the natural powers of the digestive organs, and induce disease: they possess but very little, if any, nutritive quality, and are only useful to gratify the palate, and avert for a time the consequences of excessive indulgence in rich and hearty food. Vinegar and salt are appropriate articles of diet, and serve a useful purpose in the animal economy. Vinegar allays thirst, and operates as a refrigerant; it acts as a solvent of some of the alimentary principles, and thus aids in the process of digestion. Salt, the chloride of sodium, is an essential constituent of the blood. Hydro-chloric acid, which is found in a free state in the stomach, is also derived from it.

Nearly all animals possess more or less appetite for salt, in consequence, no doubt, of a constitutional demand for the elements it contains. It is therefore not only an agreeable relish to other food, but is an indispensable portion of our diet. Fruits, when ripe and in a good condition, are highly agreeable and wholesome luxuries, that may in their season safely form a moderate portion of each meal. But a great variety of fruits at the same meal are liable to disturb the digestive organs, and prove injurious.

Milk is the only alimentary substance that is fully adapted to meet all the varied wants of the body. Some variety of food is therefore more agreeable and more conducive to health than a diet limited to one or a very few simple articles. Accordingly, we find that, wherever the condition of men will admit of it, they universally make use of more or less variety of alimentary substances, and that this variety increases very much in proportion to the wealth and ability which exists to gratify the desires of the palate, till multiplied luxuries become the sources of unnumbered physical evils.

Too great a variety of alimentary substances, whether simple aliments or the compounds of skillful cookery, is always injurious when it becomes a temptation to excess. Few men who habitually burden their stomachs with a little of all the luxuries which find a place on many public and private tables, can long escape the just punishment of violated physical law. The stomach has imposed on it not only the digestion of an excessive amount of food, but a great variety of different substances, which, collectively, become far more difficult of digestion than a meal that is made from a smaller number of articles. In this country, the means of living are so abundant, and so easily obtained, that there is a constant tendency to an excessive indulgence of the appetite. Thus, a much larger amount of food is taken than the wants of the body require, and more than the digestive organs have the capacity to dispose of. Second courses, served up in every variety of style, to gratify the pride of the host, too often overpower the stomachs and stupefy the intellects of the guests, whose complimentary encomiums they were designed to call forth.

It is impossible to point out to each individual the kind of diet which will suit best. This, to some extent, must be a matter of personal observation and experience. Peculiarities of constitution, habits of life, age, sex, &c., require modifications of diet, in accordance with the natural

wants of each individual. The aged, whose powers of life are feeble and languid, demand a more stimulating diet than at any other period of life, while children demand a generous, but plain and unstimulating diet. Abstinence from all that is found or suspected to be injurious, uniform hours, and temperate indulgence, should be observed by all who value lasting health more than the mere temporary gratification of the palate.

CHAPTER VII.

DISEASES OF THE DIGESTIVE ORGANS.

THE digestive organs are subject to numerous diseases. Among these are several of an acute and inflammatory nature, such as gastritis and enteritis, or inflammation of the mucous membrane of the stomach and bowels; while others are of a slow or chronic character. The acute diseases are usually caused by sudden exposure to cold, and suppression of the excretions of the skin; by atmospheric influences, or by improper diet. To this class of diseases children are peculiarly subject. Adults suffer principally from slow or chronic disease, and from that disordered condition of the organs of digestion, usually called dyspepsia. The consequence of improper care of these organs often shows itself in the organs or tissues. Not unfrequently, the powers of the digestive organs become impaired only so far, at first, as to interfere with the perfect nutrition of other parts. The respiratory organs, the nervous or muscular systems, will become thereby weakened, and the whole body debilitated; so that the first excess or irregularity, or the first exposure to cold, develops disease either in these or in some other part of the body. Thus indulgence in too great a variety of meats, in highly-seasoned dishes, rich soups or rich sauces; in vinous or spirituous liquors; over-loads or over-excites the

stomach, and disposes it, as well as the brain and the bowels, to inflammation, or to functional and organic disease. If the digestive organs do not themselves become diseased or enfeebled, under a course of high living, general plethora is often induced, predisposing to inflammation in early life, and to gout and apoplexy at a later period.

On the other hand, an insufficient, meagre, innutritious diet, composed of food of a watery consistence, predisposes to disease, because it does not afford a sufficient amount of nutrition to maintain the powers of life. It is also a source of irritation to the stomach and bowels, and may give rise to typhoid fever, dysentery, cutaneous diseases, worms, consumption, and scrofula. The digestive organs often hold out for a long time against the most perverse indulgence in a pernicious and unwholesome diet, and then suddenly give way, rarely to recover their original tone and vigor.

BOWEL COMPLAINTS.

The acute diseases of the digestive organs prevail most among children, though adults are by no means exempt from this class of diseases, but are less susceptible, and perhaps less exposed, to the causes which affect the digestive organs at an earlier period of life. Nearly one-fourth of all the diseases which occur under the age of twelve, are caused by some disease of the alimentary canal. The most common forms of this class of diseases are popularly known as "bowel complaints," and include cholera-morbus, diarrhea, and dysentery. Cholera-morbus and diarrhea may be the result of simple functional derangement of the organs, or of an inflammation of the mucous membrane of the stomach or the bowels. The causes which produce this whole class of diseases are so general and so essentially the same, that they may all be included under one general description.

Children are most subject to "bowel complaints" during warm weather. Those occupying unwholesome, ill-venti-

lated, damp and filthy dwellings, or in the crowded and contracted alleys of cities and towns, are most afflicted. Children are most susceptible to this class of diseases during dentition, and during the period of change from a natural to an artificial diet.

The system of indiscriminate diet, allowed children in this country, is a most fruitful cause of stomach and bowel complaints. In most families, children over two years of age are allowed to sit at table, and indulge in the same kinds of food as the older members of the family. No matter how great the variety, they are permitted to partake of all sorts indiscriminately, and in many instances parents seem to take great delight in seeing them dispose of the most hearty articles of food. At breakfast they are allowed hot rolls and butter, hot buckwheat cakes, hot Indian cakes, sausages, salt fish, bacon or dried beef, and coffee or tea. At dinner, they are indulged in various meats and in a variety of vegetables, and in rich puddings, pies, &c. At tea, they are permitted to indulge in bread and butter or in hot cakes, with preserves or stewed fruits, or with cucumbers or radishes. Where the general bill of fare is so generous and bountiful, it is not to be expected that they will be denied cakes, both rich and plain, candies, nuts of various kinds, raisins and fruits, &c., at all hours of the day, not excepting the last hour before retiring to bed. Where children are allowed to make use of such an indiscriminate and unwholesome diet as is permitted in far too many families, it is no matter of wonder that the organs of digestion should become diseased, and that a fearful mortality should attend this hazardous period of life.

"Bowel complaints" are also induced by exposure to cold, and sudden changes of temperature. Hence they prevail most in August and September, when the approach of cool nights makes considerable contrast in the temperature during the middle of the day and at evening.

The best safe-guards against bowel complaints will be found in an uniform and wholesome diet, and in proper

protection against sudden changes of temperature. Extra clothing should be resorted to on the first approach of cool evenings—at least, an extra garment should be put on at or before sun-set.

With the first indications of the invasion of either of these complaints, there should be an entire abstinence from the ordinary diet, and but very little nourishment of any sort taken; and it will frequently happen that a day or two of abstinence from food will allow a complaint to get well, which would otherwise prove exceedingly troublesome.

The use for a few meals of stale bread toasted, and ate dry with only a little salt, will, in the early stages of the disease, often prove an effectual remedy for diarrhea. Rice, wheaten grits, farina, corn-starch, and all farinaceous articles of this class, may be used in moderation, provided they are taken plain, and but one kind of either at a single meal. In some cases, abstinence from liquids will be found beneficial. A very common evil in the domestic management of diarrhea and dysentery is, to try a great variety of mixtures, and pay little or no attention to the diet. There is no doubt but that all the specifics and panaceas for these complaints may be useful in their appropriate cases; but it requires a nice discrimination and a high degree of intelligence to select, in each case, the best remedy. In one case, a laxative may be needed; in another, an astringent; in another, an anodyne; in another, a stimulant; in another, an acid, and in another still, an alkali. A vast amount of sickness is caused by an indiscreet exhibition of medicines that are just the opposite of what they should be. One individual may by chance need and take an astringent medicine, and be promptly relieved by it. His neighbor thinks his own complaint is the same, and takes the same medicine, but with an opposite result. Instead of relieving disease, he has only aggravated it, and brought on a fever. Many severe cases of typhoid fever are thus produced by an

indiscriminate exhibition of astringents for the relief of diarrhea or dysentery. Other remedies, when indiscriminately used, have produced similar results. No class of complaints require so much care and intelligence in their management, and none are so often subjected to quackery and ignorance, as diarrhea and dysentery.

It is well known that there is a strong sympathy between the mucous membrane of the alimentary canal and the skin. Frequent bathing or sponging the surface of the body, or an occasional warm bath, will almost always afford important relief in any complaint of the mucous membrane, especially in the commencement of the attack.

DYSPEPSIA.

Dyspepsia, which consists in an impaired and fastidious appetite, in slow and difficult digestion, or in sensations of discomfort in the region of the stomach, or in constipation of the bowels, and flatulence, is a disease so common in this country, as to require special consideration. The varieties or forms of dyspepsia, and the causes which induce it, are exceedingly numerous. This arises mainly from the different conditions of the digestive organs. The organic sensibility of the stomach—its secretions, its muscular contractility, its circulation, the condition of the liver, the pancreas, or the bowels—the state of the mind or the nervous system—all these causes conspire to give this Protean-like disease an indefinite and varied character. The symptoms of dyspepsia are still more numerous than the conditions which give rise to it. Loss of appetite or loathing of food, occasional nausea, acrid or acid eructations, heartburn, a sense of distention of the stomach, a feeling of weight or oppression about the stomach, and in some cases various uneasy and even painful sensations, are experienced during the process of digestion, and characterize the disease in its more recent or acute form. In the confirmed or chronic form, there is more or less general debility, and more or less indication of physical and intellectual inactivity.

ity. There is unusual disposition to sleep, though it is often disturbed and unrefreshing. The appetite is capricious and irregular, being very slight in the morning, while it may be insatiable and voracious at dinner. A full meal is followed by heaviness, yawnings, stretchings, and an almost irresistible disposition to sleep. The bowels become costive and irregular; the countenance becomes pale and unhealthy; there is likewise loss of memory, lowness of spirits, and mental apathy or indifference.

Dyspepsia occurs most frequently between the ages of twenty and forty-five, and finds most of its subjects in the upper and middle classes of society. Its predisposing causes are sedentary occupations, especially when carried on in close rooms and factories; indolent habits of body and mind, long and intense study, undue care or anxiety, insufficient exercise in the open air, luxurious living, indulgence in sleep, and confinement in close or ill-ventilated apartments.

Dyspepsia is spoken of by medical writers as comparatively a modern disease. When business-men journeyed on horse-back, in the private carriage, or by stage, and professional men had their small farms—when the domestic spinning-wheel and loom were in vogue, and manual labor, even to fatigue, was not thought degrading, if not decidedly vulgar, indigestion was far less common than at present. Rail-cars and steamboats, with the luxurious living they afford, however useful in other respects, are much inferior to the more tardy means of locomotion of by-gone days in promoting good digestion. While the causes of mental excitement are constantly becoming more numerous, and the mode of living more luxurious, the incentives to bodily exercise have been growing less and less.

Some of the worst forms of dyspepsia are induced by the habitual use of tobacco. When smoked or chewed, it causes an unnatural waste of the saliva, and a consequent depreciation of that fluid. It has a special influ-

ence on the organic nerves, impairing their power and energy. Tobacco acts as a pleasant and agreeable stimulant to the nervous system, but ultimately weakens and exhausts the very powers which were at first exhilarated by its use. Loss of appetite, with incapacity of the stomach to digest food when taken, hypochondria and melancholy, seriously afflict those who devote themselves to the fashionable use of this loathsome weed; though the evils resulting from this habit do not overtake the transgressor till after the nervous system has become slowly and stealthily impaired by protracted use of the poison. But the progress of recovery is equally slow, and far more doubtful. When that portion of the nervous system which is immediately concerned in the digestive process has become prostrated and enfeebled, through the influence of a deadly poison, it can rarely, if ever, be restored to its original energy and power.

Another very prominent cause of the prevalence of dyspepsia in this country is the excessive use of cathartic medicines, usually in the form of pills. The amount of this kind of medicine in actual use, if told, would be wholly incredible. One concern in New York, and that not so extensive as many others, turns out, by the aid of steam-propelled machinery, no less than ten barrels per day, or over three thousand barrels annually, of cathartic pills. These pills, which are highly drastic and stimulating to the mucous membrane of the alimentary canal, are kept constantly on hand by immense numbers of people, as an ever-present relief for any slight attack of indigestion or any other illness, however trivial; and multitudes resort to them, as promoting health, while in the full enjoyment of its blessings. A temporary relief from the consequences of high living is doubtless experienced from the use of this class of medicines, but the ultimate result is to weaken and impair the organs of digestion.

Excessive indulgence of the appetite, a great variety of incongruous articles at the same time, too large a propor-

tion of hearty food, a hurried manner in eating, indulgence of the appetite at irregular hours, late suppers, intense application of the mind to study or business without sufficient exercise, confinement in ill-ventilated rooms, mental excitement, cultivation of the fancy and the passions, and the use of tobacco, tea, coffee, and alcoholic liquors, may all be included in the list of causes which induce dyspepsia. Some one or more of these causes will be found to have existed with nearly every individual who has been afflicted with this disease.

The medical remedies which have been proposed for the relief of dyspepsia are as numerous as the causes and symptoms of the disease itself. To name them would be but little else than giving a catalogue of the *materia medica*. The chief reliance for success in the treatment of the disease will be found in a prompt and absolute avoidance of the causes which induced it. The dyspeptic, whatever his former habits may have been, must first learn how and what he can eat with impunity. This, to some extent, must be a matter of personal experience, since it often happens that those articles which are readily digested by some, will disagree with others. Some facts, derived from general observation, are worthy of consideration. Vegetables are slower of digestion than animal and farinaceous aliments, and more liable to undergo the acetous fermentation in weak stomachs, occasioning acidity and flatulence. Fat and oily meats are also very indigestible, and give rise to acidity or rancid eructations and heart-burn. Soups and liquid foods are acted upon by the stomach with great difficulty; and if the diet consist chiefly of them, furnish insufficient nourishment, and never fail of producing the more severe forms of dyspepsia and the disease of debility. Soups are also hurtful when taken at the commencement of a meal, unless taken with bread, rice, or some more solid food, to give them consistency.

Rich cakes, puddings, and pastry of all kinds, are most difficult of digestion, and not to be indulged in by the

dyspeptic. Plain animal food, when free from fat, and well broiled, roasted or boiled, and in moderate quantities, with bread, rice, or dry mealy potatoes, will constitute a meal that can be taken by almost any dyspeptic. Fish, which holds an intermediate rank between the flesh of warm-blooded animals and vegetable food, as to digestibility, will be found to disagree with some dyspeptics, though it is often made indigestible by the rich saucers taken with it. Vinegar and lemon-juice promote its digestibility. It is most digestible when boiled, and the least so when fried. Fruit and milk should not be taken at the same meal with fish.

Water should be the only drink of the dyspeptic, and should not be taken in large draughts during or soon after a meal; extremes of temperature should be avoided, as drinks either too hot or too cold are injurious, even to a healthy stomach. The dyspeptic should take his meals at regular and uniform hours, and allow himself an hour's rest, or only very gentle exercise; though he ought at other hours to take much exercise in the open air, selecting, if possible, that which will bring the greatest number of muscles into moderate action, and afford recreation from accustomed labors. Perhaps no exercise is more valuable to the dyspeptic than horse-back riding. A journey on horse-back, though not in fashion, has more to recommend it as a remedy for dyspepsia, than any thing that can be furnished by the pharmacopæia.



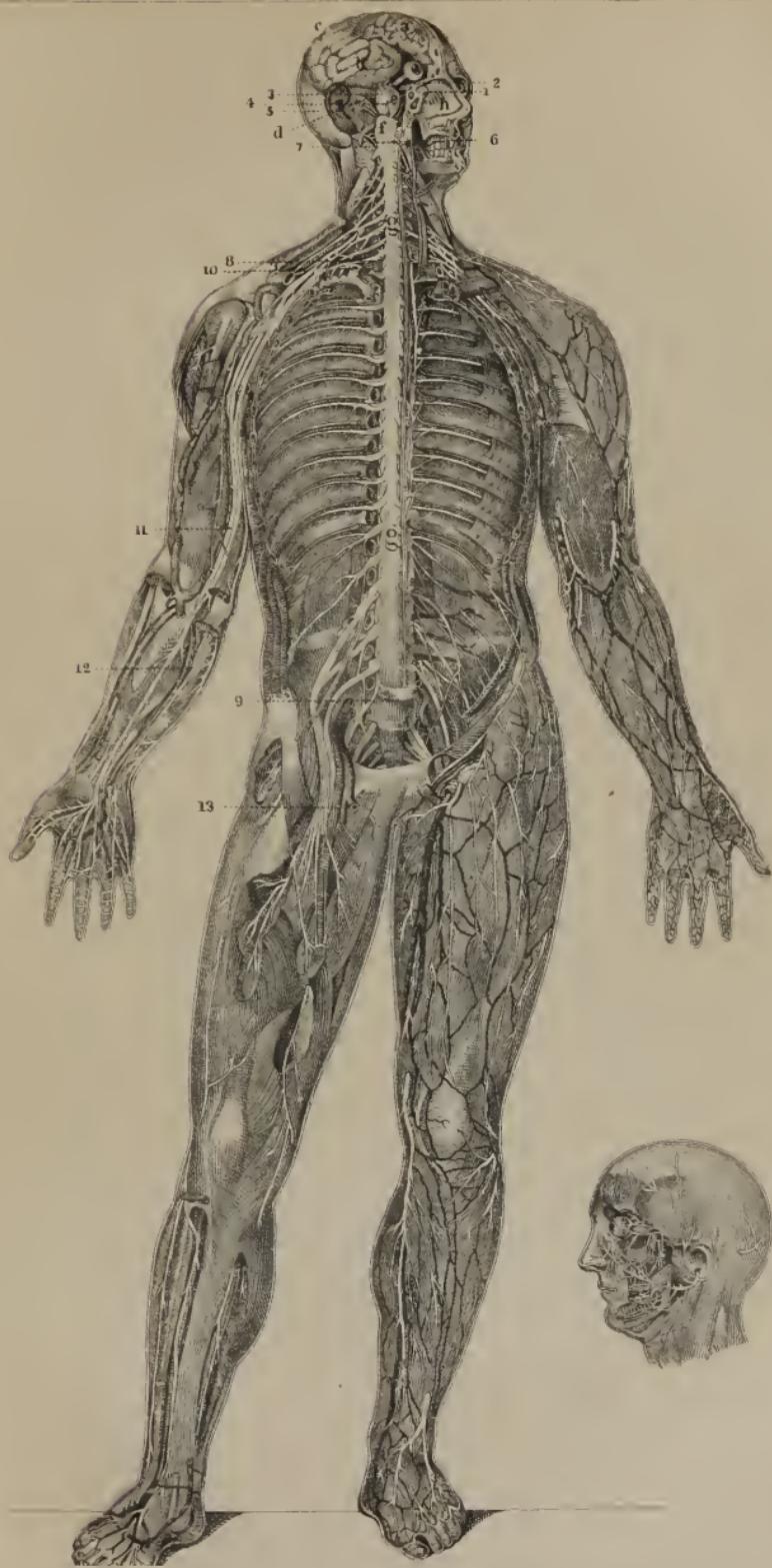
PLATE IV.

BRAIN, SPINAL CORD, AND NERVES.

FIGURE 1 represents a front view of the brain, spinal cord and nerves, with a portion of the cranium, the side of the face, and the front of the spinal column, removed.

a, Anterior lobe of the cerebrum or large brain. *b*, Middle lobe of the cerebrum. *d*, Cerebellum or small brain. *e*, Pons variolii, a broad transverse band of white fibres, which arches across the upper part of the medulla oblongata, and connects together the two lateral lobes of the cerebellum. *f*, Medulla oblongata, the upper enlarged portion of the spinal cord. *g, g*, Spinal cord. *h*, Septum nari, or partition between the nostrils. 1, Olfactory nerve, or nerve of smell. 2, Optic nerve, or nerve of sight. 3, Origin of the fifth pair of nerves, the branches of which are distributed to the side of the face, the teeth, and the tongue. 4, Six pair of nerves. 5, Origin of the seventh pair or auditory nerves. 6, Origin of the eighth pair. 7, 8, Cervical nerves. 8, 9, Dorsal and lumbar nerves. 10, Brachial plexus, or net-work of nerves. 11, Median nerve. 12, Ulna nerve. 13, Nerves of lower extremity.

FIGURE 2.—*Distribution of the Nerves on the left side of the Face.*—The nerves are given off from the brain and spinal cord in pairs. Thus each half of the body is supplied with its own set of nerves. From the base of the brain and within the cranium there are twelve pairs of nerves, from the spinal cord thirty-one pairs; making in all eighty-six nerves which are given off from the nervous centres. A most remarkable sympathy is established between the brain and the different parts of the body, by means of the spinal cord and the numerous nerves which ramify and branch off from the nervous centers to every tissue and organ of the body. In man, who possesses the sense of touch over the whole surface of the body, the nerves are so minutely distributed that it is impossible to penetrate the cutaneous covering of the body without wounding some one of these ever-watchful sentinels.



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CHAPTER VIII.

THE NERVOUS SYSTEM.

FUNCTION OF THE NERVOUS SYSTEM—INFLUENCE OF THE BODY ON THE MIND—INFLUENCE OF THE MIND ON THE BODY—INTELLECTUAL PURSUITS NOT UNFAVORABLE TO LONGEVITY—CAUSES OF THE IMPAIRED HEALTH OF LITERARY MEN—INTELLECTUAL POWERS OF CHILDREN—EARLY DEVELOPMENT OF THE MIND NOT DESIRABLE.

THE nervous system, considered as a whole, is the organ of sensation, of voluntary motion, and of mind. In some of the lowest orders of animals, it serves no higher purpose than to render the individual conscious of the presence of foreign bodies, enabling it to receive by appropriate organs whatever may contribute to its nourishment, and to avoid and reject whatever may be injurious or useless. At each step in its progressive development, the nervous system becomes the medium of the manifestation of higher powers and faculties, until, in the human species, it attains its perfection, and becomes the instrument of those phenomena of mind and of thought which dignify and enoble man. In each link of the ascending chain of being, we discover an approximation to ourselves in habits, instincts, and propensities, varying in the different species in accordance with the development of the nervous system. In man, the brain, which is the centre of sensation and the special organ of intelligence, is vastly superior to that of all others. His nervous system being more fully developed, as well as more perfectly organized, renders man more highly nervous, or more susceptible to various impressions, as well as more intelligent than any of the inferior orders. Though we can boast of the possession of all the higher mental faculties, and a more acute sensibility to nervous impressions, we must also acknowledge the existence of infirmities and liabilities from which other

animals are exempt. The relations of the brute animal to the objects which surround him, have reference mainly to the gratification of his appetites or the supply of his bodily wants and his preservation from injury or destruction. If his appetites are satiated, and he is exempt from physical pain and the fear of danger, the mere animal is apparently happy in simple existence, and falls asleep or remains at rest. But it is far otherwise with man. When his physical wants are gratified, and he has abundant provision for all his necessities, and he is exempt from the remotest apprehension of danger, he is still restless and unsatisfied. Free from all present evils, his active mind is ever stretching forward into the future for the attainment of some imaginary good, or is agonizing on the rack of self-inflicted torture through fear of some impending evil. Thus, much of his suffering and disease has its origin in those very susceptibilities of his nature which constitute man's superiority over other animals. But when all the faculties—the intellectual, the moral, and the physical—are properly educated and duly cultivated, much, very much, may be done to avoid those mental sufferings, and to escape from those diseases which naturally result from a misguided exercise of one class of powers.

INFLUENCE OF THE BODY ON THE MIND.

The brain, which is the organ of the mind, and the seat of the acknowledged superiority of man over the whole animated existence, is not only the centre where all external sensations are perceived, but it is also in deep sympathy with all that is passing within. Through the spinal cord and the nerves, every organ and every tissue, and each minute fibre, has a telegraphic communication with the fountain from which every passion and every feeling flows—with the abode of consciousness—the throne of intellect, of reason, of memory, of judgment, and of every manifestation of mind. And the mind, though in a certain sense independent of matter and constituting a distinct essential

principle of itself, is nevertheless bound to the material organization by ten thousand ties, which can be sundered only with life itself. Thus, while the mental emotions and the intellect itself are modified, if not governed, by the states and conditions of the bodily organs, no part or organ of the body is exempt from the influence of mental operations. Hence, the mind, through the nervous system, is made to participate, more or less, in all that affects any portion of the body, and to sympathize in all the various changes which occur to it, either in health or disease. Appetite, hunger, thirst, fatigue and relaxation, labor and rest, variations of temperature, excess of heat and cold, all make their impressions upon the organ of sensation, of thought, of reflection, and of judgment. Since the mind is the exponent of all the impressions made on this organ, the phenomena of thought must, to a great extent, receive their character from physical causes, operating through the nerves which are distributed in the various organs.

The sympathy between the brain and the organs of digestion is remarkable. The stomach, probably, has a greater influence upon the passions, habits, and morals of men, than any other part of the body. The state of the stomach may be pretty correctly ascertained by observing that of the passions and feelings; and by the diet adopted, and the consequent condition of the stomach, may be learned the moral character and intellectual habits of the individual. Those who eat large quantities of hearty food become either morose and irritable, or dull and stupid. They are unable to apply themselves to intellectual pursuits with efficiency and success, or to sprightly and active physical exertion. Men who give themselves up to the gratification of the appetite, seldom practice self-denial in any thing else. The will seems to lose its control, and mismanagement of the stomach is followed by all the evil effects which spring from abandonment to any other vicious propensity. Indeed, the study of the stomach has been

said to be the study of morality. He who controls his appetite will possess self-control in other respects; and the loss of self-control is sure to follow the unrestrained indulgence of the appetite.

Upon the mind of the student, the influence of the digestive organs, through the nervous system, is most marked and peculiar. When he has eaten too much for the powers of his stomach, his thoughts seem weighed down by an incubus which they cannot throw off. All power of vivid conception and expression is gone. He can neither think, nor write, nor speak, with his wonted ability. On the contrary, a light and simple diet allows the brain to perform its duties with ease and clearness. The mind becomes active, and the imagination elevated.

Nothing is more destructive in its effects than constant mental labor combined with too free indulgence in the pleasures of the table. No literary man can long sustain the joint operation of these excesses upon his health. The brain and the bowels soon become equally sluggish and equally impaired, and that dreadful train of nervous diseases ensues, the horrors of which too many have experienced. In these cases, the over-burdened stomach is often relieved by the ruinous practice of taking cathartic medicines—a mode of relief which only complicates the symptoms—until a pill, or a powder, becomes a necessary precursor to successful intellectual effort. Byron says of himself, “The thing that gives me the highest spirits is a dose of salts.” It diminished, for a time, that irritability and congestion which his habits tended to perpetuate. In the end, however, as his biographer tells us, the practice of taking purgatives ruined his health, and was one of the chief causes of that weakened condition of his frame which rendered him unable successfully to cope with a disease by no means commonly fatal in its termination. In his case, as in that of all literary men, the first causes of the necessity of taking purgatives should have been avoided.

The effects upon the mind, of that derangement of the

liver so often the consequence of improper eating and drinking, are somewhat peculiar. When this important organ becomes inactive or diseased, and unable properly to perform its functions, all the powers become oppressed with a melancholy—dark, despairing, and constant. Intellectual exertion is impossible; the brain becomes confused; the attention cannot be fixed; the pleasure and the desire of life vanish; the moral susceptibilities are blunted, and the victim becomes a prey to wild and desperate fancies. The disordered brain reacts upon the muscles, and an aversion to physical exercise ensues, the effect of which is to perpetuate and confirm the mental malady. The only remedies which can minister to a mind thus diseased, are to be found in a total abandonment of the practices which have caused it, and the adoption of a systematic mode of diet and exercise.

The muscles sustain a peculiar and important relation to the nervous system. The capacity of the brain for the endurance of mental labor depends, in a great degree, upon the proper exercise of the muscular powers. When the muscles become weak and flabby, through inaction, the brain becomes correspondingly incapable of vigorous effort, and the nerves lose their firmness and tone. On the contrary, a well-developed muscular system, hardened by exercise, is seldom accompanied by any form of nervous disease.

INFLUENCE OF THE MIND ON THE BODY.

The influence of the mind on the body is not less important than that of the body on the mind. The entire body may be regarded as an assemblage of organs for the manifestation of mind. Thus, the hand, the eye, the muscles which control the features, are made to express, more or less forcibly, the varied emotions of the mind, and their very form, to a certain extent, is indicative of its prevailing character. The intellect is thus stamped upon every feature and lineament of the man. Hence, the man

of high intellectual culture differs from the untutored savage, in his external appearance, not less than in the character of his mind. In the same manner the habitual exercise of particular passions engraves on the features an indelible impression of their existence, and hence we are accustomed to judge, and often correctly, of the prevailing disposition by the features of the face. Thus, Cesar, while he put trust in the fat, sleek-headed Mark Antony, regarded with suspicion the lean and hungry look of Cassius:

“Would he were fatter! But I fear him not.

Yet, if my name were liable to fear,
I do not know the man I should avoid
So soon as that spare Cassius.”

The influence of mind on the body is still more apparent in producing and modifying disease. Every part of the body has borne testimony to the potency of strong mental emotions. An idea, when it becomes all-absorbing, has force enough to prostrate the stoutest man in a moment, and a word has blasted all his dearest and most cherished hopes. All that life held dear—“His only child has died—the partner of his life is snatched away—he has but heard it—nothing has touched his body, but the iron has entered his soul.” Sleep has gone—sorrow and bitter grief take its place—and he refuses to be comforted; his appetite fails—digestion is suspended—and the heart enfeebled. Some disease speedily comes to his relief—and sets his spirit free. We have heard of those who have become “gray-haired, with anguish, in a single night.” The painful passions invariably produce a depression of the vital energies, unless they break forth into violent action. When the pent-up feelings of the heart find expression in tears and lamentation, there is much less to be feared than when they are still and speechless; for—

“ * * * * The grief that does not speak,
Whispers the o'er-sraught heart, and bids it break.”

But the pleasurable passions, when not exercised in ex-

cess, impart a pleasing and healthful tone to all the organs: the heart beats more freely, sending the vital fluid in full vigor to its extreme tissues. "Thus, Hope enchanted smiles, and waves her golden hair, as she dances before us on the hills and in the valleys; health and laughter vie in her steps, while we gaze upon her joyous beauty; a lithe-some spirit animates our limbs, and the blooming hilarity of her features is reflected from our own."

Our passions may be regarded as the conservators, as well as the disturbers, of the health of our bodily organs, since they exert an important influence over all their functions. In like manner, an excessive exercise of the intellectual faculties has a tendency to enfeeble and impair the vital energies, by concentrating in the brain that energy which the other organs of the body require for the full performance of their functions.

INTELLECTUAL PURSUITS NOT UNFAVORABLE TO LONGEVITY.

There is abundant evidence that a temperate exercise of the intellect, when joined with habitual muscular activity and a due regard to the diet, is not unfavorable to bodily health and longevity; for we cannot suppose that we are endowed with faculties of so delicate an organization that their legitimate use is to detract from our personal happiness, our health, or our longevity. On the contrary, all the organs are made for exercise in their appropriate sphere; and when each organ is performing its part in the phenomena of life, the highest degree of health and happiness is enjoyed. It is well known, therefore, that the muscles of the body, when not exercised, not only cease to grow, but they shrink in size, and their energy and power are diminished. If the functions of the brain are not exercised, it diminishes in size, and the mind becomes less and less energetic. In idiots, the brain is almost invariably found diminished in size. In general, it will be found that the more an organ is exercised within

the limits of its natural capacity, the more it is developed, and the better it is able to execute its functions. Literary men have in all ages been long-lived: the class of learned men who have lived more than seventy years, includes the most distinguished that have ever existed. Harvey lived to eighty-one, Jenner to seventy-five, Boerhaave to seventy, Sir Edward Coke to eighty-four, Newton to eighty-five, and Fontenelle a hundred. Many of the prominent intellectual men of our own country have attained to very great ages. The average age of the thirty-five Northern delegates who signed the Declaration of American Independence was seventy and a half years. Chief Justice Marshall and Thomas Jefferson reached their eighty-fourth year, Doctor Franklin and John Jay their eighty-fifth, James Madison his eighty-seventh, John Adams his ninety-first, John Quincy Adams his eightieth; Henry Clay died in his seventy-fifth, Daniel Webster in his seventy-first, and the Duke of Wellington in his eighty-fourth year. All these men were engaged during the greater portion of their lives in the most profound mental labors. Doctor Franklin continued his public services till he was eighty-two, and his intellectual exertions to near the close of his life. In a letter to one of his friends, written when he was eighty-two years old, speaking of his advanced age, he says: "By living twelve years beyond David's period, I seem to have intruded myself into the company of posterity when I ought to have been abed and asleep; yet, had I gone at seventy, it would have cut off twelve of the most active years of my life, employed too in matters of the greatest importance."*

The ancient sages, whose studies were often prosecuted in the open air, and who taught their pupils while walking in the fields and groves, attained to greater longevity than those of modern times. Thucydides, the celebrated Greek historian, and Solon, the famous law-giver of Athens, reached the age of eighty; Thales, one of the seven wise

* SWEETSER on *Mental Hygiene*, p. 52.

men of Greece, lived to ninety-six; Xenophon, the Greek historian, and Galen, a distinguished physician, who is said to have written no less than three hundred volumes, both attained their ninetieth year. Sophocles, the celebrated tragic poet of Athens, died in his ninety-fifth year—not in the course of nature, but from being choked with a grape-stone. Zeno lived to ninety-eight; Hippocrates to ninety-nine, Xenophanes, one hundred, and Democritus one hundred and nine.

IMPAIRED HEALTH OF LITERARY MEN.

Notwithstanding the obvious conclusion that intellectual pursuits, when associated with correct physical habits, are favorable to health and longevity, it is true that a majority of the professional and literary men of this country possess imperfect health, and many are worn out prematurely—though the diseases of literary men are much oftener dependent on the abuse of their bodies from sedentary habits, neglect of exercise, injudicious diet, inconsiderate indulgence of the appetites, and the use of nervous stimulants, than on the amount of their mental labor, the necessity of bodily health to successful intellectual effort, is very readily acknowledged by all who give the subject any thought; and yet our schools, academies, colleges, and all the educated portion of society, furnish most melancholy demonstrations that the body is lost sight of in the cultivation and exercise of the mind. A brilliant genius or a highly cultivated mind, when joined to a debilitated body, renders its possessor an object of pity, rather than a useful member of society. The noblest powers are fettered by physical weakness, and cannot rise in their full strength and dignity. In the clerical profession particularly, many of the finest intellects are lost to their possessors and to the world, because there is not physical strength enough to sustain the mind in its labors.

In females the consequences, to the nervous system, of neglecting physical health, are still more melancholy. The

young female of twelve or fourteen, with her beautiful figure, rosy cheeks, sparkling eyes, and airy step, presents a picture full of life and happiness; at once attractive and lovely. The mind too possesses the same healthful sprightliness and vigor. At about this age, the lively motions of the body and limbs must be restrained, and the hypocrisy of what is called "woman-like deportment" is made to conceal every impulse of life and vivacity. The disposition for activity is controlled, if not destroyed, by an artificial system of dress and manners. Confinement soon begets a frivolous disposition, and a nervous irritability. The muscles become weak and flabby, and unable to sustain the bony frame, and the bones themselves are softened in structure. Permanent deformity of figure soon follows; digestion and nutrition are imperfectly performed. At the youthful age of twenty, three-fourths of what are called well-educated ladies have lost the freshness and beauty of youth—have become pale, slender, and unhealthy, and for ever unfitted for the high duties of life.

While the physical powers are thus fearfully neglected, little regard is had to the capacity of the nervous system to endure mental labor. The brain must become fatigued, exhausted, and debilitated, just in proportion to its inability to endure the amount of mental effort imposed on it. Therefore, to preserve a sound mind in a sound body, the habits of both must be in accordance with the laws growing out of their mysterious union. In all exercise of the intellectual powers, there must be an abundant nutrition of the nervous substance, and a due supply of highly oxygenated and purified blood. Hence, intellectual effort is as truly exhausting to the physical powers as any kind of physical labor, and there is the same demand for rest and relaxation. When the mind is exercised, there is an increased flow of blood to the brain. This is very apparent, from the fullness of all the blood-vessels about the head, when the passions are excited. In anger, for instance, the little vessels of the eyes become so dis-

tended as to be "*blood-shot*," as it is called, and the blood-vessels of the face are so full as to give a fiery-red appearance to the whole countenance. In long-continued, close application of the mind, the extremities have a constant tendency to become unusually cold, while there is an increased temperature of the head.

The brain of a student as imperatively demands rest as the muscles of a laborer. The muscles in the arm of a smith, for instance, after a certain amount of labor, become fatigued, and then grow weaker, if labor is continued, till the arm is comparatively powerless. Just so when the will has wearied the brain in close study, an indescribable confusion comes over the mind, that forbids all further effort till rest is taken. The muscles and the brain both gain strength by alternate labor and rest, when they are properly nourished; but the kind of rest required by the one, is very different from that required by the other. To refer to the smith again: the instant he lays down his hammer, his muscles begin to take their rest. Not so with the brain of a student. The mind we regard as constantly active, at least during the wakeful hours. The student may, therefore, lay down his pen, or his book, and even leave his study, and yet his brain may find no rest. It may continue to act on the same subject for hours, while the individual is apparently engaged in very different occupations. Thus, men who become intensely interested in any particular study, exhaust their powers with the most surprising rapidity.

To receive rest for the brain, the mind must cease to act on the subject that induced the fatigue. Either some new subject must engage the attention, or the mind must be allowed to contemplate a variety of new objects. New scenes must be presented, and new trains of thought awakened. A vast amount of intellectual imbecility and physical weakness, disease, and suffering, has been caused by a disregard of these principles. We believe the number of students who injure themselves by active study, however, is very small, compared with those who are

injured by the want of proper rest and relaxation for the brain. In the intervals of study, the mind is allowed to follow the same trains of thought that induced the fatigue. A student of geometry, for instance, who leaves his study for a walk, and occupies his mind in revolving over the proposition he has just demonstrated, will be sure to return with a brain as much fatigued as before. His ability for continued study is much less than that of one who spends the same length of time in active, vigorous exercise, which calls the mind to an entirely new and different field of thought. Daily exercise that interests the mind, and calls it off from its accustomed labors, is indispensable to the mental and bodily health of all persons who devote themselves to study, and it is unquestionably the true way to think. The best thinkers are those who possess the power of exerting their brains with the most energy for a limited period of time, and who then take liberal relaxation. The brain thereby exercises the power of prompt, energetic action; and when it acts, it is to some purpose. Those who keep the brain constantly at work, either become dull and lazy thinkers, or are prematurely worn out.

The present condition of many of the educated portion of society in our country, admonishes us of the vast importance of seeking some remedy against the effects of literary pursuits and sedentary habits on the physical and mental powers. Professional men, and students of both sexes, are constantly "*breaking down*," while yet in the morning of life. Many of the first class of professional men are obliged to suspend their labors for a foreign tour, in order to recruit their worn-out bodies, and to rest awhile from their cerebral occupations, while many others are under the necessity of withdrawing entirely from the field of literary pursuits, and of seeking some employment in which less is required of the nervous system. In various ways, for the want of sufficient physical health, the services of educated men, to a most melancholy extent, are lost to the interests of education, the church, and our country.

In regard to the causes of so much failure of health among the educated, there can be but one opinion. The muscular system is weakened for the want of proper exercise and nourishment, and the nervous system is exhausted by excessive application. It is often difficult to determine, however, whether more students lose their health from too much mental labor, or from the want of sufficient bodily exercise. We are of the opinion, upon the whole, that notwithstanding both causes may operate conjointly, a majority of those who have the credit of "*breaking down*" from hard study, do not deserve it. Their health is sacrificed, not to science, but to bodily indolence. Nothing is more natural than for inactivity to beget an instinctive dread of active exercise. A man with a fractured leg, who is exceedingly impatient and restive under the confinement of the first week, will come to dislike exertion in a few more weeks, and will have but little disposition to move about when he has permission to do so. So the student, who has neglected exercise till all his powers are suffering for the want of it, will undertake with reluctance a walk of a mile or two, which would once have given him much pleasure. Fatigue, after a short walk, becomes the prominent feeling, and he returns with the idea that exercise, since it brings on fatigue, is not only useless, but hurtful to him. In the mean time, he finds his relish for food and his ability for study gradually diminish, till he is ultimately obliged to abandon his books for a time, and perhaps spends the remainder of his days as a "*literary dyspeptic*," under the honor of having ruined himself by *hard study*.

Of all broken-down constitutions, that of the literary invalid is the most difficult to repair. His is not the wreck of sudden violence, but a gradual, insidious wasting of the basis and frame-work of his organization; and his is an existence of no common suffering. His physical power is gone, but his nervous system has lost none of the acuteness of its sensations. It is, in fact, more susceptible of

impressions, more irritable, and more capable of suffering than before. Little occurrences annoy and disturb him, and he becomes irritated and vexed with every little mishap in the affairs of life. If his literary labors are not entirely neglected, he finds it exceedingly difficult to proceed with them. At times, he feels that his friends have deserted him, or have no sympathy for his misfortunes. The world has lost its attractions and its loveliness, and he would gladly exchange positions with the day-laborer in the street. Such, in brief, is the condition of most of those who have cultivated the mind and neglected the body.

INTELLECTUAL POWERS OF CHILDREN.

The capacity for mental labor varies exceedingly at different periods of life, and education should be conducted with direct reference to this fact. In children, the brain is considerably larger, in proportion to the body, than in adults. The nervous system is correspondingly more active. All the animal functions are performed with more activity. Respiration, circulation, and digestion, take place with greater rapidity. With growing years, all these processes become slower, while there is a constant increase of the ability for patient, persevering application of both mind and body. The powers of the child seem adapted to rapid transition from one object to another. His mind is constantly on the alert for something new—something to see, handle, and taste. All his senses are acutely alive to the investigation of the properties of the various objects that come within his grasp; and it really seems as though his nature felt that life was too short for the great work of investigating the external world. Continued application to a particular object is wholly incompatible with his natural impulses. Fatigue very soon ensues, when this is attempted. It is as impossible to confine the mind of a child to a particular object, for any great length of time, as it is to teach its body to remain in one position.

EARLY DEVELOPMENT OF MIND NOT DESIRABLE.

Most teachers and parents seem to set a high value on the amount of knowledge children are made to acquire, as though it was an index of future greatness. But the history of distinguished men will show that early mental culture is not necessary to produce the highest powers of mind, and the history of precocious intellects, if it were written, would show that all mere hot-house culture of children prevents rather than favors ultimate greatness.

The greatest men of any age have rarely reached their full maturity till about forty, and have seldom manifested extraordinary powers under twenty. Under twelve they have usually won more *eclat* in the fields of sport than in the halls of science. Tissot, a celebrated French physician, says, in a work on the "*Health of Men of Letters*," "that the effects of study vary much, according to the age of the student. Long-continued application in infancy destroys life. I have seen young children of great mental activity, who manifested a passion for learning far above their age; and I have seen with grief the fate that awaited them. They commenced their career as prodigies, and finished by becoming idiots or persons of very weak minds. The age of infancy is consecrated to those exercises which fortify and strengthen the body, and not to study, which enfeebles it, and prevents its proper increase and development. Of ten infants, [says he,] destined for different vocations, I should prefer that the one who is to study through life, should be the least learned at the age of twelve." Chancellor Kent gives his early history as follows: "I was brought up among the highlands and hilly parts of Connecticut, and was never kept on the high-pressure plan of instruction: it was not then the fashion. I went to school, and studied in an easy, careless way, until I went to college. I was daily, and sometimes for a month or more, engaged in juvenile play and occasional efforts on the farm. I was roaming over the fields, and

fishing and sailing and swimming and riding and playing ball, so as not to be but very superficially learned when I entered college. When I went to study law, I had my own leisure, and great exercise and relaxation in enchanting rides and home-visits, until I got to the bar. I lived plain, drank nothing but water, ate heartily of all plain, wholesome food that came in my way, was delighted with rural scenery, and active and healthy as I could be. Here I laid the basis of a sound constitution, in which my brain had not been unduly pressed or excited, and only kept its sympathy with the rest of the animal system. It was not until I was twenty-four that I found I was very superficially taught, and then voluntarily betook myself to books, and to learn the classics and every thing else I could read. The ardor and rapidity with which I pursued my law and literary course was great and delightful, and my health and spirits were sound and uniform, and neither has faltered, down to this day."*

Harriet Martineau, in writing of the early education of Walter Scott, says: "Here was a boy lying about in the fields, when he should have been at his Latin Grammar; reading novels, when he should have been entering college; spearing salmon, instead of embellishing a peroration: yet this personage came out of this wild kind of discipline, graced with the rarest combination of qualifications for enjoying existence, achieving fame, and blessing society. Deeply learned, though neither the languages, nor the philosophy of the schools formed a part of his acquisition; robust as a ploughman, able to walk like a pedlar, industrious as a handcraftsman, intrepid as the bravest hero of his own immortal works. Here is enough to put us inquiring, not whether learning, and even school discipline, be good things, but whether the knowledge usually thought most essential—the school discipline which

* This was written in 1833.—*Mental Cultivation and Excitement.*—BRIGHAM.

is commonly esteemed indispensable—be in fact either the one or the other.”*

The examples of Chancellor Kent and Sir Walter Scott, though not proper to be adopted as models for the most successful education of other minds, nevertheless show that early development of the mind is not indispensable to ultimate greatness. On the contrary, it is evident that those who have adopted such habits as to develop in due proportion the mind and body, are at the age of twenty the most likely to become distinguished as men of learning. The great object to be aimed at in the early stage of education is mainly to secure good physical health, and interest the mind in study—laying the foundation for those intellectual habits which shall be adapted to obtain knowledge in after years. For those who are to enjoy subsequent advantages, the amount of knowledge which has been acquired at the age of twelve years is of but little consequence, compared with a good bodily physical organization.

Sir Isaac Newton, according to his own statement, was inattentive to study, and ranked very low in the school until the age of twelve. Dr. Adam Clark was considered “a grievous dunce” at ten, and was seldom praised by his father but for his ability to *roll large stones*. Henry Clay, who was known as “the Mill-boy of the Slashes,” worked hard on a farm till he was fourteen, and enjoyed no advantages for study, except such as were obtained by an occasional attendance at a log school-house. Patrick Henry was so ungainly in his figure and address at twenty-four, that John Randolph refused to examine him for admission to the bar till he found he was well recommended. Daniel Webster spent much of his time on his father’s farm till he was eighteen. A very large proportion of the New England men who have become distinguished for their learning, enjoyed but very limited advantages till they were over twelve—most of them having attended

* *Mental Cultivation and Excitement*, by BRIGHAM.

school only three months during the summer, and three during the winter.

Parents and teachers often make a great mistake in attaching a high value to the knowledge acquired during childhood. According to the history of nearly all learned men who have lived to be great benefactors of their race, those minds will be likely to attain the greatest perfection whose powers are disclosed gradually, and in due correspondence with the other powers of the constitution, though the mind should by no means be left wholly untrained and uncultivated. Children, when left to themselves, always manifest a disposition to acquire knowledge which is quite as important to them as the verbal drudgery which they are often required to learn at school. The boy who has spent the day in constructing his little dam and his mill in the brook or the streams that run in the gutter, or in making a wind-mill, a wagon or a sled, or in flying a kite, may have acquired more valuable culture than another who has spent the same length of time in some hard study, which is beyond his comprehension, and in which he fails to be interested. The *Book of Nature* is ever open to the truly philosophic spirit of youth, and they will often gather from it principles and truths of the highest practical value. They thus obtain knowledge quite as important as is ever acquired at school. Parents and teachers need not, therefore, lament that children committed to their charge make but little progress in book-knowledge, so long as they exhibit signs of activity and intelligence in other matters.

While at school, special care should be observed not to demand of the brain more than it is able to perform, and the field of knowledge to the young should always be made pleasant and attractive. Not that the rugged ascent should be levelled down, nor should they always be kept in the plane at the foot of the hill of science. Vigorous, persevering labor is indispensable to the full development of the powers of the mind, and it is safe and proper when

rightly applied. We believe there is an instinctive love of knowledge in all minds, but every mind has a capacity and a track of its own. Within its own capacity, and in its own sphere of action, the mind finds healthful pleasure in surmounting difficulties, just as healthful physical labor imparts vigor to the body, and gives new zest and new relish to the appetite. The great secret of safe and successful teaching lies in the adaptation of instruction to the capacity of the young, and in not requiring more than the brain is able to perform; though there is no necessity that knowledge should be diluted and simplified till it is reduced to dialogues and pictures. The whole course of teaching should have for its object to lead out the mind to think for itself in quick sympathy with those who teach.

The great fault of most teaching, is an abortive attempt to drive the mind through a monotonous routine of tasks and verbal drudgery, without any reference to the scholar's power of comprehension and understanding. The brain is thus wearied and jaded, like a pack-horse beneath his burden, and all to no purpose. The mind either has no relish for such labor, and is disgusted, or turned against it, or all the energies are ultimately crushed beneath its unnatural load. Such, to a great extent, is the influence of imposing long lessons, in which the mind cannot possibly perceive any good, nor feel any interest more than would be experienced in the reading of a dictionary. To be sure, a child, by extraordinary exertion, will occasionally commit to memory perfectly a long column of words, and their definitions, when it cannot take the least interest in the task, while the majority of minds will be fatigued and disgusted. But the drawing on the black-board of a map of a particular country, and a description of its soil, its productions, its inhabitants, its mountains, and rivers, are all matters of pleasant and useful knowledge. So the description of the heart, and its action in man and in the lower orders of animals, is something the mind can grasp and retain with pleasure. The reflective and perceptive

faculties in the young are most active, and most proper to be cultivated. The mind of a child is seldom so stupid as not to be interested in something it can perceive and reflect on or think about. Such objects only should be presented to the mind as it is capable of learning. Perfection should be the rule of all progress. A single truth, remembered and understood, strengthens the mind and develops the powers of the brain, while a mass of learning, half understood and half remembered, begets confusion of the mind, and fatigues the brain.

The nervous system of students of all ages is too often made to suffer, in order to gratify the teacher's love of display. The success of the school and the merits of the teacher are thought to depend on the amount of studies pursued in a given time. Study is added to study to fill up every hour, and in some instances every minute, till the whole nervous system begins to suffer with feverish excitement. Under this process of forced development, the bodily health is gradually undermined, and the brain exhausted and enfeebled. Young ladies are made to suffer from this system more than the other sex. At boarding-school they are allowed less exercise, and are required to pursue a larger number of studies. We have known instances in which girls have been taxed with six or eight different studies—more than double the number that any ordinary mind can pursue with safety and profit. It is well known, that the mind for a time seems rested by changing from one study to another; but, in point of fact, it is no rest for the nervous system: it is only adding a new stimulus to excite further exhaustion of the brain. A great variety of studies is therefore the most sure way that can be imagined of literally using up and spending the greatest possible amount of nervous power. Those teachers who attempt in this way to stimulate the minds of their pupils to extraordinary exertion, incur a most fearful responsibility of sacrificing mental vigor, health, and life itself, to a wicked ambition for imparting to them

a vast amount of knowledge in a very little time. As a natural result of this system, young ladies who "finish their education," as the process is called, at the popular schools, return to their friends with impaired health, to sink into a premature grave, or, with intellectual inactivity, to drag out a miserable existence, scarcely more tolerable than death itself.

If sufficient vigor of constitution is retained to avoid the immediate consequences of the attempt to crowd the mind, a reaction ensues, in which the body for a time asserts its rights to be cared for, and the mind, as by a law of nature, seeks quiet and rest. Hence, many young ladies literally finish their education at the boarding-school, and never after manifest a disposition for study. For the same reason, children who are precocious or remarkably forward while young, seldom realize in after-life the brilliant promises of childhood. Early or rapid intellectual development is, therefore, to be feared and avoided, rather than encouraged. And all those means that are resorted to, for the purpose of stimulating to still greater efforts those whose brains are already too active for the health of their bodies, are productive of much more evil than good. Extraordinary appeals to the pride and ambition of youth to exceed their competitors, may make brilliant scholars at the recitation, and give an institution an excellent name, but they rob the world of the usefulness of many of the choicest spirits. "The laurel crown is commonly for the dead;" if not corporeally, yet mentally. Those who attain the highest honors of their *Alma Mater*, are generally diseased men. "Like phosphorescent insects, their brilliancy lasts but a little while, and is at its height when on the point of being extinguished for ever; or, having reached the object of their ambition by concentrating their energies, an intellectual palsy too often succeeds, and their bodies partake of the trembling feebleness. The impression of undue determination remains upon the brain, which continues subservient to the ambi-

tious will, until its structure and its functions fail together. The early effort opened a fountain of energy abruptly: it cannot be perennial; the waste is more rapid than the supply, and, like water bursting from its channel, it must run to waste until violence ends in exhaustion."

Regular daily exercise of the muscles, and relaxation from mental effort, are the only sure means of avoiding these evils. So long as the vital laws of our organization remain in force, these are the imperative conditions on which men of sedentary habits may continue the enjoyment of health, and the vigorous exercise of their intellectual powers. All men are incapable of constant mental labor, and the necessity of rest and relaxation to the brain is as essential to its vigor as the supply of nutriment to the body. Without exercise, all animals lose their vigor, and become feeble and diseased. The kind of exercise proper for persons of sedentary habits, depends on a variety of circumstances that will be considered in connexion with exercise and recreation.

The habitual use of stimulants of all kinds is decidedly injurious to the nervous system of the sedentary. Under their influence, the action of the brain is exalted above its natural standard, while it suffers an equal depression when the stimulant has spent its force. The natural normal action of the brain is most uniform, and most perfect, and its powers are correspondingly more enduring, when it acts spontaneously. Narcotics and stimulants, when used, are both prejudicial to the permanent vigor and health of the brain.

CHAPTER IX.

DISEASES OF THE NERVOUS SYSTEM.

THE fatal diseases of the nervous system are less numerous and less common than those of the respiratory and digestive organs. The brain and its membranes are each subject to inflammation, and to slow chronic disease. The spinal cord and its membranes are seldom subject to acute inflammation, though chronic disease is more common in this portion than in the cerebral part. The nerves are exceedingly liable to an affection called *Neuralgia*—that is, pain of a nerve.

Among children, the diseases of the brain constitute a much larger proportion of deaths than among adults. According to the best medical authorities, the diseases of the nervous system are the cause of about one-fourth of the whole number of deaths under fifteen years of age. Most of the affections of the brain, which will be described only in general terms, may be slow and tedious, or very sudden in their invasion. In a majority of cases, they are sudden, attacking their victims while in apparently good health. Head-ache is a nearly invariable symptom in children old enough to describe their feelings, and it is usually accompanied by vomiting and constipation. In infants, pain in the head is to be inferred when the child frequently carries its hands to various parts of the head, and presses strongly against it, and when the head is constantly rolled from side to side. At other times the child is dull and sad, or excited and irritable by turns; it shuns the light, or closes the eyelids and contracts the brows, when it falls on the face. The sleep is restless and disturbed, and accompanied by grinding of the teeth, and is frequently interrupted by the child's starting, and uttering a sudden, shrill scream, as if in pain. After a few days, and in very severe cases a shorter period, the senses become affected—the child sees double, or has

strabismus, or has dullness of vision, and begins to talk incoherently. These symptoms go on increasing in severity till it becomes stupid and unconscious of all surrounding objects, and may remain so for several days, or even till its friends begin to desire death as a relief from its sufferings, which are more apparent than real to the victim of the disease. Sometimes the disease commences with convulsions, and then runs a rapid course to a fatal termination, without any premonitory symptoms which indicate to the friends its approach. The symptoms which attend this disease are exceedingly unlike in different cases, and at different periods of the same case. This is owing mainly to the fact that different portions of the nervous system are affected in different subjects and in the successive stages of the disease in the same individual.

The most common causes of disease of the brain are falls, blows on the head, exposure to a strong light, or to the hot sun, mental excitement, &c. Cerebral disease is often the result of a premature development of the mental faculties. Such melancholy cases as the following are quite familiar to every physician practicing in villages and cities, where there is the most done to secure rapid growth of the mind. A child eight or ten years of age becomes deeply interested in its studies—is ambitious to be the first in its class—studies earnestly at school, and reads more or less at home—is admired and praised by the teacher and by the friends, and is pointed out as a very good or perhaps a very remarkable scholar, till by and by the child returns from school with a headache: this head-ache results in disease of the brain and death. A fair flower, "no sooner blown than blasted." Many parents are thus chastened with bereavement for their indulgence and pride in pushing forward a mind already too active for its body. The treatment of disease of the brain requires the early and earnest efforts of an intelligent physician. It can be prevented only by most

judicious management of the mental and physical powers. The passions and emotions must be held in check while the organs of the body are to be well nourished and exercised.

INSANITY.

Insanity, strictly speaking, is not either a mental or a bodily disease, but it is a disturbed reciprocal relation of mind and body. It is manifested in a great variety of ways and forms. The disorder of the intellect may be very slight, affecting apparently only particular faculties, or it may involve all the intellectual powers. It may be manifest in melancholy—in moroseness—in good humor—in hilarity—or in raving madness; or it may be confined to a single subject—when it is called *Monomania*.

Some of the most important causes of insanity, as given by Dr. Butler, of the Hartford Retreat, in his report for 1848, are as follows:

"Insanity is frequently the result of other diseases, first breaking down the energies of the system, and rendering it incapable of resisting the new attack, or more frequently leaving it in that weak and susceptible condition, that undue effort, either mental or physical, easily induces disease of the brain.

"Generally, agricultural communities present less of the affection of the brain than the inhabitants of cities, large towns, and dense manufacturing villages. The causes of this may be found in the more quiet and less exciting pursuits of the former community, and, with some exceptions, hereafter to be named, from the more regular and healthy habits of life, in regard especially to labor, and early and sufficient rest at night; and, on the contrary, in the latter, in the crowding of the population into dense neighborhoods, in the close and impure air, and in the imperfect ventilation of their dwellings, in less nutritious food, and the greater excitement and anxieties of those thus situated.

"The difference between the appearance of the children

in a close city street, or dense and restricted neighborhood, and those in a village highway, forcibly illustrates this principle. Whatever invigorates the general system is the best safeguard against insanity. The child, who, with a close and restricted play-ground, without permission or opportunity of indulging in the natural, free and boisterous spirits of childhood, with his pampered appetite, his overtired brain, urged by foolish ambition to undue application, attains a premature manhood with a deficient development of his mental and physical energies, and an unnatural exaltation of his nervous system, can hardly compete in the race of life with him in whom the early development of his physical system has prepared the way for the full expansion of the mental powers. The one is liable to sink early under the influence of disease; the other to enjoy the conscious power of an energetic mind in a sound body. Our wards, like those of other Lunatic Hospitals, present many painful illustrations of the result of erroneous physical and moral training. We frequently see cases of insanity, whose remote but true cause is to be found in the erroneous education of the child."

"Intemperance is one of the most prolific causes of insanity. Probably as many cases originate from the indirect effects of the moderate use of ardent spirits, as from the direct influence of immoderate and reckless indulgence. In the above classification of causes, this latter class only is embraced. The effect of habitual intemperance at this day, needs no explanation. The greater danger arises from the indirect and sometimes unsuspected influence of the moderate use of alcohol. The use of such a powerful drug as alcohol in any degree, tends to predispose the system to disease, though it may not, in all cases, or for a considerable length of time, directly induce it. The brain, the stomach, the liver, and all the important organs of the body, must be injuriously affected by the use of this aerid narcotic.

Certain it is, that persons who use it are (other things being equal,) in more danger of becoming insane than the temperate; because the brain readily sympathizes with the disorders of the other organs, especially with those of the liver, which in recent cases of insanity is very frequently found extensively disordered. Alcoholic stimulus, even in moderation, induces undue mental and physical efforts; the mind and body are overtaxed, without due regard to caution in exposure, needful rest, and the other essentials of continued good health.—Under this continued and unnatural stimulus, the brain and nervous system become unduly excitable; plans of business are laid down and pursued with less judgment, prudence, and success; habits of intemperance, with diminished means of support, follow. With the increased privation of the comforts of life, there is less and less ability and willingness to bear with composure and cheerfulness daily trials and anxieties. Home is made unhappy; the general health fails. The wife and mother now share these evil consequences, and her burden thus becomes more oppressive and heart-sinking. Thus, in the train of intemperance, come the successive results of numerous causes classed under over-working of body and mind, general ill health, domestic unhappiness, all tending to the same end,—mental derangement. These are not fancy sketches; the histories of these cases are before us, and could be given."

Want of self-control has been indirectly the cause of more insanity than any other single evil. Though care, anxiety, grief, distress, disappointment, jealousy, and wounded self-love may be the immediate cause of mental derangement, yet these causes may have operated with equal force on other minds, and not have produced the same result. Where the power of self-control is feeble, or has never been called into exercise, the mind readily yields to the slightest exciting cause. Thus, a child who has always been indulged in the full gratification of all its desires, till

it has come to feel that it must be gratified at all events, has grown up a stranger to disappointment, and cannot bear it like one who has early and faithfully learned the lesson of submission. Many a child has thus learned to be governed for the first time in the mad-house, though it may seem quite unaccountable to the heart-broken parents that the first disappointment should send their son or daughter to the house of the insane. A child that has learned the true meaning of submission to parental authority, though govcrned, possesses in its truest sense the power of self-government—a power which may be said to stand at the helm of all mental emotion, and quiet the reason through all the perils of anxiety, care and disappointment. Through the want of proper restraint during infancy and childhood, the passions grow with their growth and strengthen with their strength, till they become wholly uncontrollable, usurping the power and driving reason from her throne. It has been estimated that one in every two hundred and sixty-two of the population of the United States is insane. In Scotland, the proportion of insane is one to five hundred and seventy-four; and in the agricultural portion of England, only one to eight hundred and twenty. Insanity prevails to a much greater extent in this than in any other country: the causes of mental excitement are correspondingly more numerous. Among the Turks, the Chinese, or the American savages, there is but very little insanity. Where the mind of the mass is comparatively stupid and inactive, insanity is almost unknown; but where, as in this country, causes of mental excitement are in constant exercise, from infancy to old age, insanity becomes a great and alarming evil, worthy of the deepest consideration. In children, strong mental excitement, premature exercise of the intellect, and injudicious development of the moral faculties, form a p̄redisposition to insanity, though children rarely become insane. In subsequent years, the excitement of business, the eager strife for wealth, disappointed hopes,

and the numerous causes of public excitement in polities and religion, all tend to develop this malady in constitutions already predisposed, and in fact educated for it. Not least among the causes of insanity, is the practice of reading the cheap and popular romances of the day, to the total neglect of the more substantial aliment for the mind. Where the baser sort of this literature is eagerly devoured by the young, the passions become inflamed by unreal scenes, and the imagination diseased by their subtle poison. And if we consider that, in addition to the pernicious influence which such books are calculated to excite, they are read by lamp or gas light till a late hour, and then form the material for the dreams of the remainder of the night, it is no wonder that our lunatic asylums are overcrowded with victims.

NEURALGIA.

Neuralgia consists essentially in violent pain in a particular nerve or particular branches of a nerve. Neuralgic pain is sharp, lancing, lacerating or darting, and may occur in severe paroxysms of short or long duration. Almost every part of the body is liable to the affection. It may affect the head, the face, the teeth; the muscles of the side, back, and limbs; or the stomach and the bowels. Nervous complaints, as they are called, have become very common in our country, and have increased very rapidly. There is a large class of persons who suffer from pains and aches, and from a great variety of anomalous symptoms, characterizing no definite disease: they are always ailing, complaining, suffering; are a little better or a little worse than usual; but are never well, nor absolutely sick. Every new doctor and every new remedy affords relief for a time, but never cures them. Such individuals are called *nervous*, and not improperly; for nervous pains and aches seem to constitute with them the principal phenomena of life. Now and then this miserable monotony of indefinite nervousness is interrupted by a severe neuralgia, located

in a particular nerve, from which the affection receives its name. It is called *tic douloureux*, when it is confined to the face; *sciatica*, when it is located in the sciatic nerve, which passes down the leg. A severe and long-protracted neuralgia is no trifling affair; for no suffering is more intolerable, or more to be dreaded. Neuralgia may be induced by all those influences that have a tendency to depress the general health, such as residence in damp localities, exposure to sudden changes of temperature, mental excitement, fatigue, &c.; but its most common cause is the habitual use of narcotic stimulants. We have rarely met with an individual who has suffered from nervous complaints or from neuralgia that has not been addicted to the use of tea, coffee, opium, or tobacco, in some form, and we have almost invariably found that the health has improved when these articles have been abandoned. All these agents act as stimulants of some particular organs, and increase their activity at the expense of others. The organs which are for a time over-stimulated, suffer a depression when the effects of the stimulants have passed off. During this depression, the individual becomes subject to various nervous complaints. Uneasiness, distress, pain, lassitude, and fatigue are experienced without any apparent cause. The individual, while more susceptible to nervous impressions, is less able to bear them with impunity.

The full effect of narcotic stimulants is not perceived at first: they seem to require a certain length of time to bring the nervous system under their power. Hence, they are often used for several years without apparent injury, and then their effects become so evident as not to be mistaken. In like manner, it requires considerable time to recover from their effects when their use has been abandoned. He who has become nervous from the habitual use of either tea or coffee, opium or tobacco, must expect that it will require one or two years to restore his nervous system to its natural vigorous con-

dition, although he may be encouraged with an almost immediate and gradual improvement of health. It is well known that neuralgia has increased in frequency in about the same proportion with the increase of the use of tea, coffee, and tobacco.—The effects of tobacco have been considered as a cause of dyspepsia, page 95.

Tea, so far as known, contains no nutritive qualities whatever, but is purely a cerebral excitant, possessing some astringent properties. Its virtues in exciting the social feelings are well known, to most of our ladies at least. When the excitement which has followed its use has subsided, there is more or less of depression of spirits, uneasiness, and general nervousness.

Coffee possesses some nutritive qualities, though they are much over-rated; the cream and sugar used with it affording the alimentary elements for which the coffee has the credit. Coffee is an exceedingly agreeable excitant of the brain, but its habitual use is followed by frequent attacks of vertigo, giddiness, neuralgia, sick head-ache, and various dyspeptic symptoms.

PLATE V.

MUSCLES.

FIGURE 1.—*Back View of the Muscles.*—On the right side, the second layer of muscles are shown, and on the left, the third layer.

FIGURE 2.—*View of the Fourth Layer of the Muscles of the Back.*

FIGURE 3.—*View of the Fifth Layer of the Muscles of the Back.*

The muscles form the greatest part of the mass of the body, and constitute what is commonly known as lean meat. The bones constitute the skeleton or frame-work of the body, and the muscles are the moving power by which the parts of the skeleton are set in motion. There are nearly five hundred different muscles belonging to the human body; nearly one hundred and fifty are concerned in keeping the body erect; and about one hundred in moving the chest in breathing, speaking, singing, &c. There are over fifty muscles which act upon the spine, and are more or less concerned in maintaining it in an erect position.

Fig. 1.

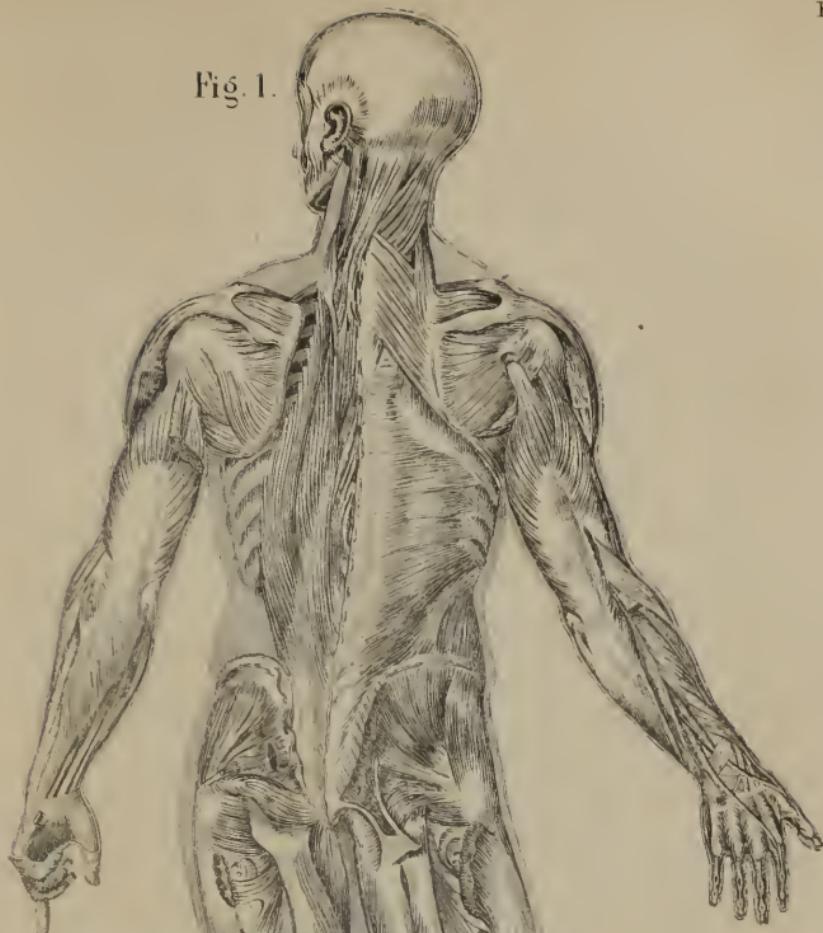
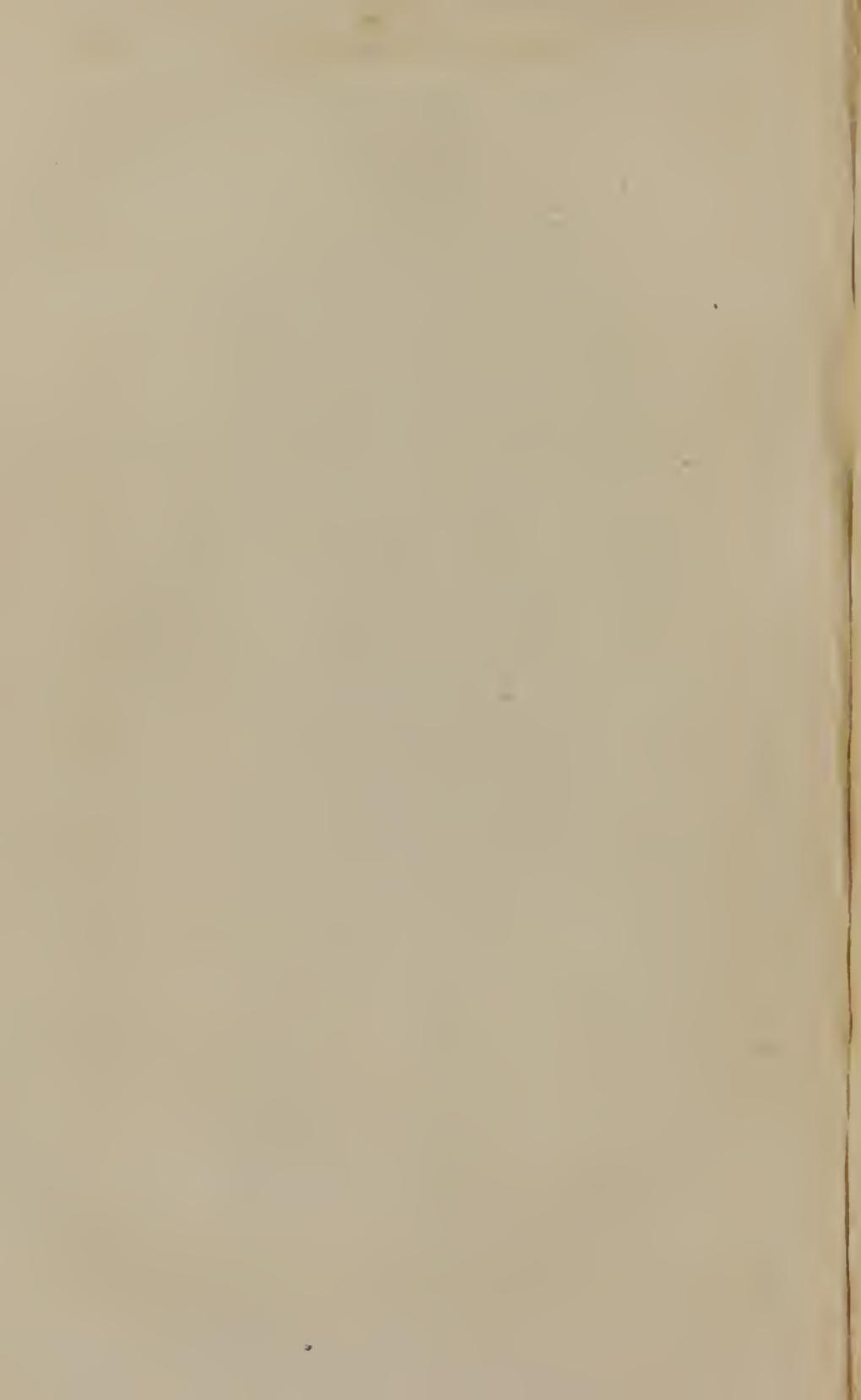


Fig. 2



Fig. 3





CHAPTER X.

EXERCISE AND RECREATION.

NECESSITY OF EXERCISE—VARIETY OF EXERCISE—EXERCISE FOR LADIES—TIME OF EXERCISE—AMOUNT OF EXERCISE.

ALL organs are designed for use, and the most perfect health is that condition of the body in which each organ performs its appropriate function fully and freely. When any organ becomes inactive, or ceases to perform its appropriate function, the tone and vigor of all the others are very soon impaired, and there is a depreciation of the general health. Action is the object for which the different members of the body were formed, and the health is therefore dependent upon their just and legitimate exercise. The muscles are specially designed for motion, and they not only serve the purpose of locomotion to the whole body, but impart activity to all the other organs. Under the influence of muscular action, the vital fluid is made to circulate more freely through all the organs and the tissues of the body, and the various changes which occur in the growth and nutrition of all the parts are performed with more energy. Young animals are pervaded with a desire of motion, as an essential means of promoting their growth and development; and when, from any cause, their freedom of motion is restrained or prevented, the deleterious tendency of the change is very soon seen in the condition and health of the body. The development of the form—the capacity for enduring bodily or mental fatigue—the enjoyment of health and happiness, and the usefulness and duration of life itself, are all made to depend upon the use of the muscles.

If we may judge from the character of their exploits, and from the longevity of their heroes and sages, the ancient Grecians were a race of as perfectly-developed men as we have any account of. During the best periods of

her history, the youth of Greece were regularly trained to muscular exercise as a branch of education. In every town there was a school or gymnasium, supported at the public expense, and furnished with every convenience for exercise.

The strength of the muscles depends mainly on their use and the amount of nourishment received into the system. The muscles in the arm of a blacksmith are proverbial for their great size and strength, which are acquired by their alternate exercise and rest. When he changes his habits, and adopts a sedentary life, his muscles gradually diminish in size and strength. By muscular exercise, the flow of blood in the arteries and veins is increased, causing a more rapid deposition of the particles of nutritive matter. When muscular exertion is long continued, exhaustion ensues. Therefore, exercise and rest should be alternate; otherwise the loss of material will soon exceed the deposition of matter. The force with which muscles contract, depends on their size and condition, together with the energy of the brain, or the excitement at the time. Thus a man under temporary excitement, or in a fit of insanity, will perform feats of strength that he would be wholly incapable of, under any ordinary circumstances. By a certain restricted course of exercise and diet, very great muscular power may be acquired. Pugilists go through such a course, and acquire an unusual amount of strength thereby. In *training*, as it is called, for feats of strength, the diet consists mostly of plain beef and mutton, with bread or biscuit, spirits of all kinds being strictly prohibited. It is found, by experience, that this kind of diet, together with proper exercise, is best adapted to produce muscular strength in all persons.

The practical importance of muscular exercise to health is acknowledged by all who reflect on the subject; and yet it is almost wholly lost sight of in our popular systems of education, and is almost universally neglected by the great majority of our literary men. Nature has taken

special care that the impulses of children should lead them to find abundant means of exercise. The properties and uses of the numerous objects around them afford ample scope for their powers, when they are permitted to enjoy a full range. If not restrained and discouraged from doing so, they are to be found in the open field or in the street, court or yard, acting out the impulses of their nature in frolicsome sports of some kind. Next to the demand in their nature for food and clothing, is the necessity for bodily exercise, and it is as imperatively the duty of parents to provide the necessary means for healthful exercise, as to provide food and raiment. Much of the so-called mischief of childhood has its origin in an innocent desire to do something or to perform some action in accordance with those higher laws of their organization which are written in the bones, muscles and tissues of the body. He who can look on the sports of childhood in an irritable, fault-finding spirit, and wish to restrain them to quiet inactivity, must either be destitute of common humanity, or grossly ignorant of the process by which Nature develops the vital powers.

The sports of youth, though often the occasion of inconvenience to those of mature years, do not give evidence of greater folly than the restraints which are often imposed on them; for we can hardly conceive of greater folly than is displayed in confining young children in close school-rooms or in the house when they ought to be running at large in the open air, and when they should be developing their bodies instead of their minds. At all ages, children should be allowed to spend some portion of each day in the open air, in the enjoyment of such amusements as are suited to their age.

Nothing but the most inclement weather should deprive them of this necessary condition of health. Whatever dangers may attend habitual exposure to the out-door air, they are in the end less than those incident to the accidental exposure of a constitution made delicate by con-

finement. Children who are allowed to go in the open air only at particular hours, should be well protected with extra clothing, that is so arranged as to allow of free use of all the muscles. Those that are permitted to range in the open air at pleasure, and at all hours of the day, should be constantly clothed warm. From three to six or eight years of age, they may spend a greater part of the day in free, unrestrained exercise, provided they are not beyond the protection and care of older friends. In so doing, the bones become firm and solid, the muscles increase in size and strength, and all the organs of the body acquire a higher degree of vital energy than can be secured by any system of in-door training.

VARIETY OF EXERCISE.

An opportunity to use the muscles is not all that is required for the growth and development of the body. It is of the highest importance that there should be a constant variety of exercise. No one set of muscles should be used to the neglect of others. To secure symmetry and elegance of form, all the muscles must be called into use. If a portion only are used, they will be fully developed, while all the others will remain weak and small. Thus, a youth whose only exercise is walking, will secure a full development of the lower limbs, while the muscles of the arms, back and chest, will be small and puny. Variety is also necessary as a stimulus to the nervous system. The energy with which the muscles act, depends mainly on the state of the nervous system. Manual operations, which have been so often repeated that they are performed mechanically, have but little influence on the mind or on the brain. Hence an artisan or a mechanic may actually suffer for want of exercise, though he is constantly at work. Only certain muscles are called into use, and they have become so familiar with this course of things, that the vitalizing energy of the nervous system is not excited. A physician, as we can testify from experience, may be lit-

PLATE VI.

GYMNASTIC EXERCISES.

FIGURE 1.—*Manner of leaping on the Vaulting Horse.*—The vaulting horse is a cylinder of wood, rounded off at both ends, and firmly supported on four stout legs.

FIGURE 2.—*Position in Side Vaulting.*

FIGURE 3.—*Vaulting on or over the Saddle.*

FIGURE 4.—*High Leap.*—The leaping-stand is formed of two upright posts with holes bored through them, about an inch apart, to receive two movable pegs, over which a line is drawn by two weights. In this exercise the leaper should always alight on the balls of his feet, so as to deaden the force of the fall by the elasticity of the feet.

FIGURE 5.—*Climbing the Rope.*

FIGURE 6.—*Climbing the Ladder.*

FIGURE 7.—*Climbing the Inclined Board.*

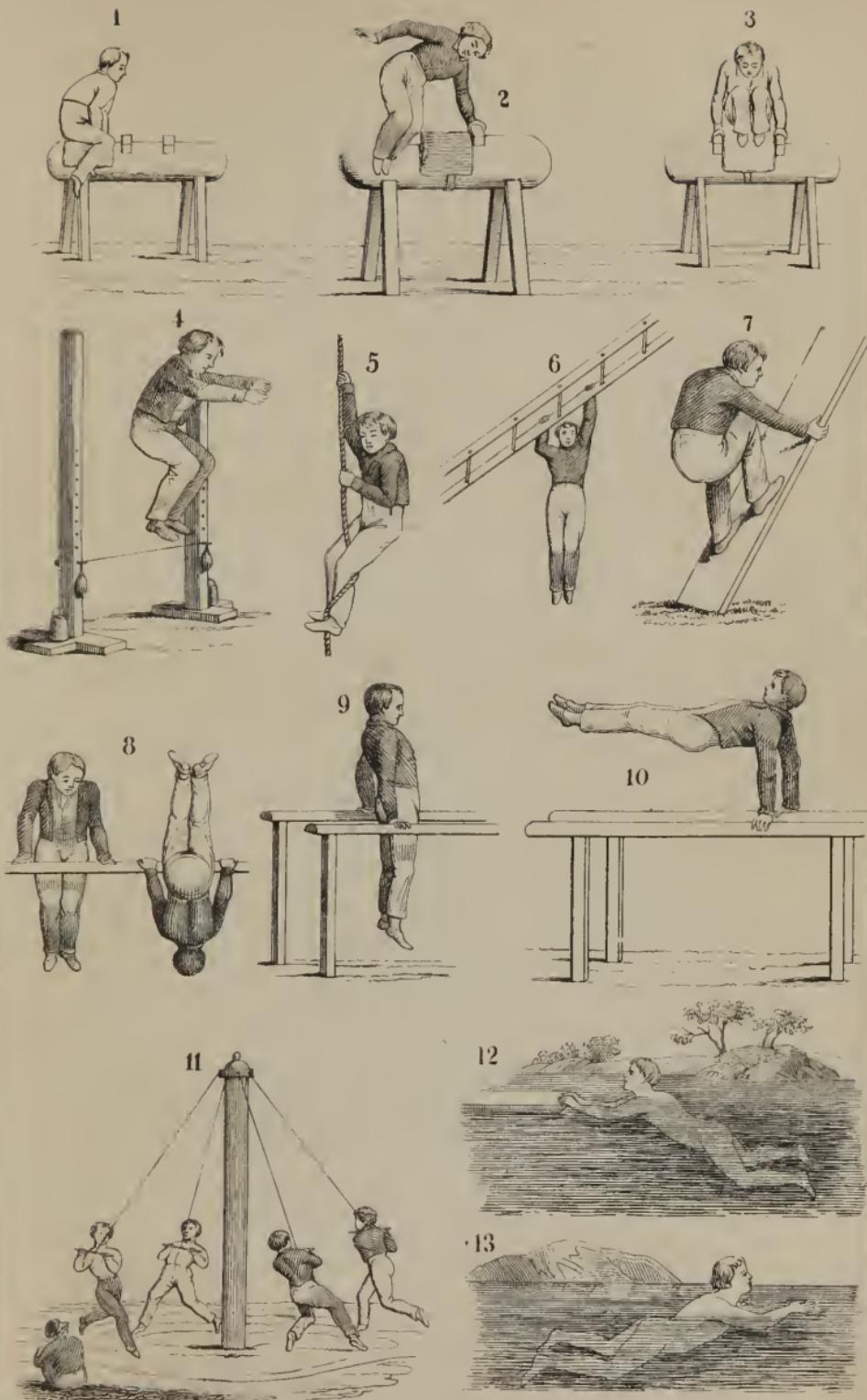
FIGURE 8.—*Horizontal Bar.*

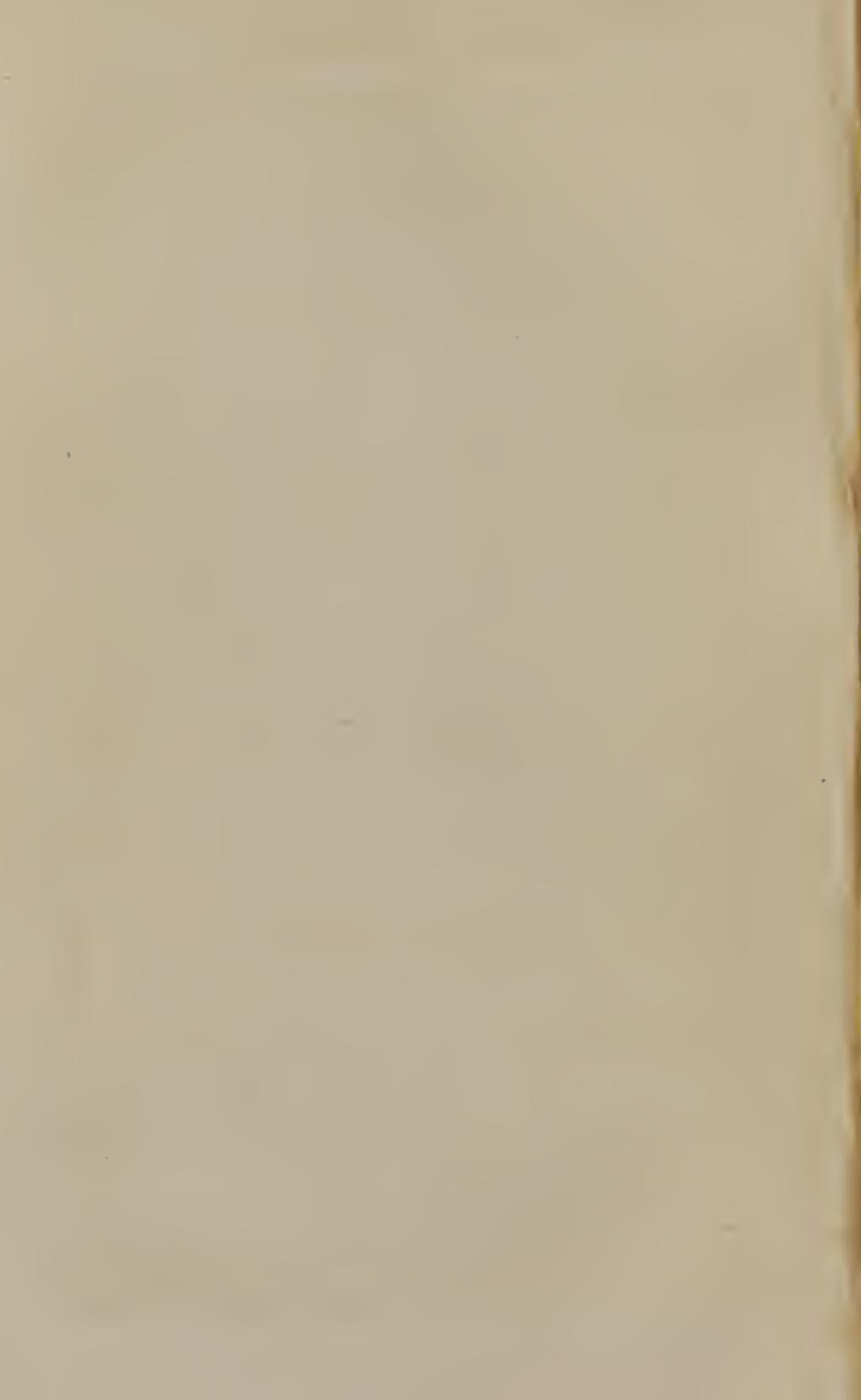
FIGURES 9 and 10.—*The Parallel Bars.*

FIGURE 11.—*Rotary Swing, or Flying Steps.*

FIGURE 12.—*Position in learning to Swim, by the aid of a Floating Plank.*

FIGURE 13.—*Position in Swimming.*





erally worn out with the labors of his profession, and yet suffer extremely for the want of some exercise to give new life and action to his system; but let him exchange places with the mechanic, and both will receive decided benefit. All persons in active life require occasionally that variety which can be secured only by relaxation from accustomed labors and recreation in a change of pursuits. Students and all persons of sedentary habits demand recreation as well as exercise, and that system of exercise is most valuable in which they are both combined most successfully.

Hence, students and literary men, though they may take a proper amount of daily exercise, are greatly benefited by vacations, in which there is a period of exemption from study and an entire change of scenes and pursuits. Manual labor is no doubt valuable, as promoting health and securing muscular strength, but it does not meet all the wants of a majority of those who are engaged in intellectual labor. It fails to interest the mind and excite the nervous system. Manual-labor schools may be adapted to educate men for a business-life, but they have thus far failed to accomplish the object for which they have been specially designed. With a majority of students, the hours allotted to work very soon become a burden, rather than a pleasure. Now and then, one turns from study to labor with pleasure and delight, and is highly benefited.

An unlimited range may be allowed in exercise. The greater the variety, the better. As a general rule, that which is most agreeable, or that which interests the mind at the same time that it calls into action the muscles, will be found most useful. Some are most interested in field sports, or in the various games of quoits, ball, wicket, &c., or in gymnastic exercises; others can more happily combine usefulness and pleasure in manual labor. Young ladies, if they choose, will find the broom and brush very efficient instruments of exercise. The sedentary of the other sex may be equally benefited by using daily the saw and the axe, and find sufficient pleasure in the evi-

dences of their skill and power which pile up before them. Gardening, too, in the season of it, to those who are fond of nature, as exhibited in the up-rising shoot and the opening bud and flower, affords the means of most wholesome exercise to the body, and most interesting diversion to the mind.

Journeying affords abundant means for recreation, but rail-cars and steamboats have but very little to do with muscular power. When journeying was performed on horse-back or in a private carriage, it was a happy combination of exercise and recreation for the invalid or the student. Horse-back riding, for those who can afford it, with a safe and spirited horse, is admirably adapted to promote health in all persons. With a good horse, the mind and feelings are often most intensely interested, and every particle of blood receives a new impulse, and circulates with renewed activity through all the vessels. Each organ is jolted and jostled till a new life is imparted to the whole system. To one who knows how to admire and appreciate this noble animal, horse-back riding is a most delightful mode of exercise and amusement.

Gymnastic exercises, which had their origin in the athletic games of ancient Greece, are remarkably adapted to the strengthening and growth of the muscular system. They consist in performing feats of strength and agility in the acts of balancing, climbing, leaping, running, vaulting, &c. The muscles acquire greater size and strength by this kind of exercise than by any other. Some of the more important gymnastic exercises are represented on PL. VI.

EXERCISE FOR LADIES.

No class of persons suffer so much for the want of bodily exercise and recreation as young ladies. The fashions and customs of society oppose almost insuperable barriers to generous exercise at this most interesting age. Any thing that approximates to free action of the muscles of the limbs and body, is regarded as unlady-like "romping,"

and therefore very improper. The young lady of sixteen must observe, in all her movements, a woman-like grace and dignity, and must studiously avoid all feats of sprightliness, as unbecoming her sex. Until more liberal views prevail, in regard to the physical conduct of young ladies, we have no hope that our educated women will ever enjoy sufficient health to maintain their true position, as happy and useful members of society. Under the present system, they must for ever remain feeble, delicate, nervous, deformed, and diseased, making life an existence of suffering and trial, such as can be borne only by a woman's patience. The affluent are required, as by a law of caste, to spend most of their time in study or reading, or on needle-work, or some frivolous work of fancy, with no other exercise of the muscles; while those of the middle classes are above the servile labor of house-work, and resort to ill-ventilated manufactories, to breathe, over and over again, the air that is kept studiously confined from October to May: many of them enjoying no thorough ventilation for more than half of the year. It is no wonder that a majority of the female operatives lose their health in a few years. Humanity and the well-being of our race most imperatively demand a reform in these respects. We have often thought that the condition of those hardy girls who toil for their week's wages in our kitchens, is to be preferred to that of the sedentary, neuralgic, and deformed ladies of the more affluent circles. Notwithstanding the ignorant and reckless imprudence of the laboring classes, they certainly enjoy more of life, are less annoyed by its ills, and better fulfil its great ends, so far as physical health is concerned.

Perhaps there is no exercise more proper and beneficial to young females than walking in the open air. It should, however, be a free, unrestrained exertion of the powers of locomotion; and, in order to accomplish the utmost good, should have an object. If a walk be taken as a matter of duty, without enlisting the feelings and exciting the

brain and nervous system, it loses half its value. Some object of interest, therefore, should be chosen to divert the mind. No better plan can be devised, for this purpose, than the adoption of a system for collecting specimens of natural history. The exercise, the calling out of the mind to the study of nature, and the specimens themselves, are all valuable. Plants, insects, birds, minerals, and shells, are each highly interesting objects of investigation and of thought, and no pursuit is better calculated to expand and exalt the powers of the mind than the study of nature. In the city, where only the works of art are to be found, a great variety of other objects may enlist the attention. In walking for exercise, the form should be erect, the muscles of the arms and chest be unrestrained, and allowed that free use which nature designed them to enjoy, and every part of the dress should be loose and easy.

Dancing is also a good exercise for young ladies. It brings into action a large part of the muscles of the body and lower limbs, and gives gracefulness and power of motion to the whole body. It is unfortunate, however, that this exercise has so often been made an occasion for midnight carousals and dissipation, that the very idea of dancing awakens a train of unwelcome associations, which every moral mind revolts against. Dancing, in itself, is an innocent and useful amusement, which should be rescued from the degradation into which it has fallen by the abuse of vicious indulgence. In crowded assemblies, in heated rooms, and at late hours of night, dancing is undoubtedly most pernicious, and we would earnestly condemn the practice under all such circumstances. We are confident that if the more opulent class of society were less censorious in regard to the amusement itself, and would direct their remonstrances against the evils associated with it, their efforts for reform would be more successful. In the ball-room, the air is usually exceedingly impure, and often overheated, and the excitement of the dance is often pro-

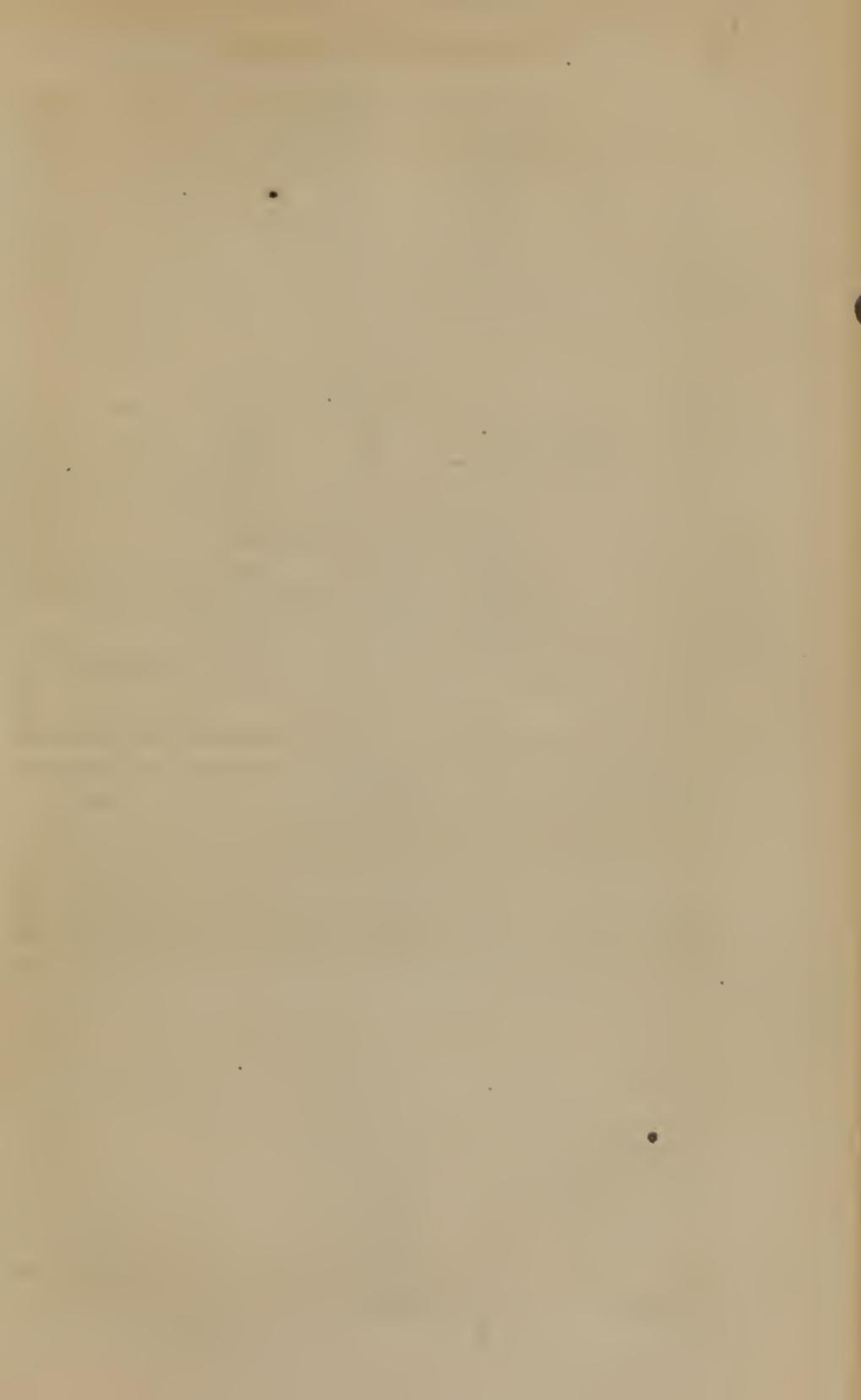


PLATE VII.

CALISTHENICS.

FIGURES 1 and 2.—*The Graces*.—This game derives its name from the graceful attitudes which it occasions.

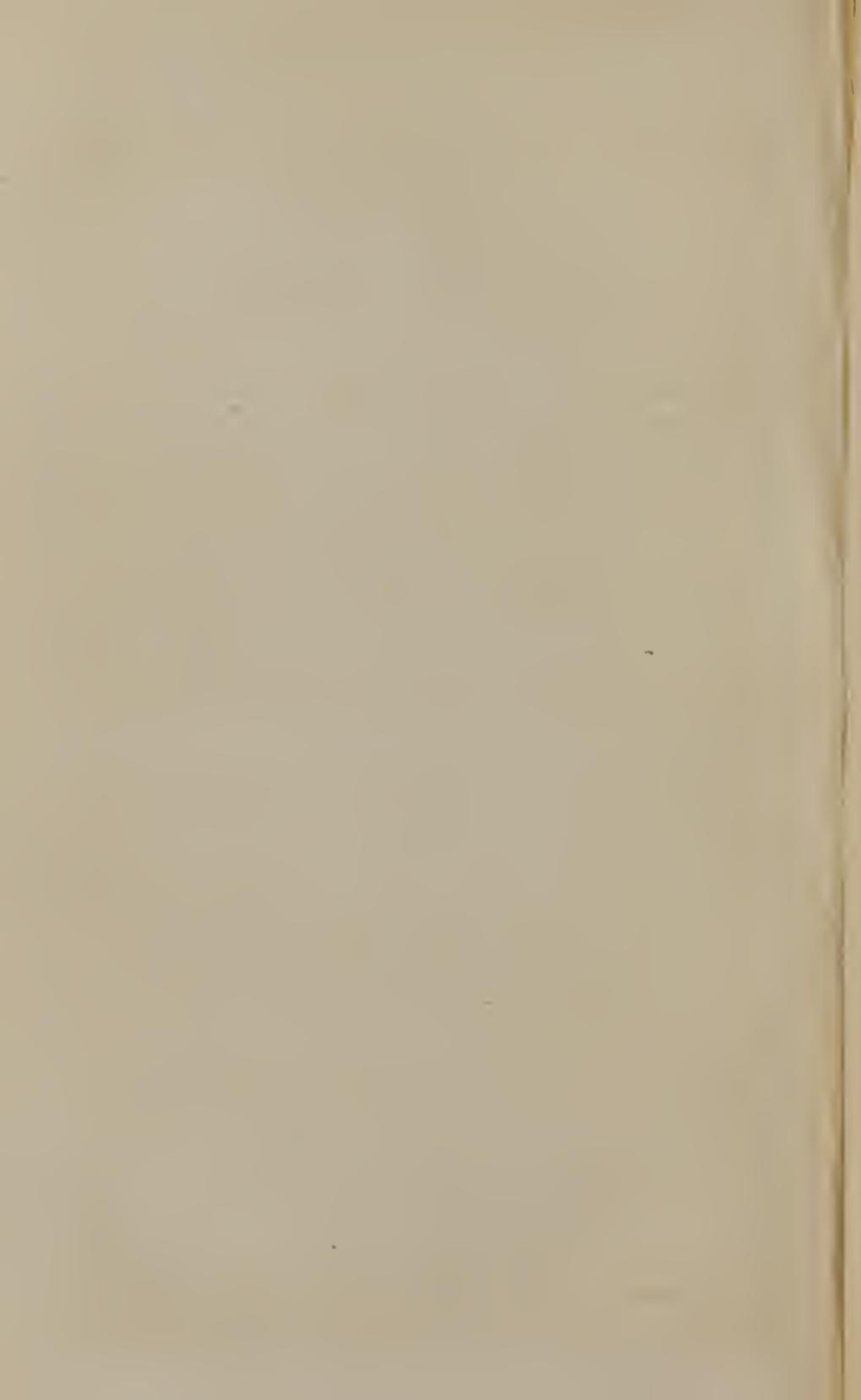
FIGURES 3 and 4.—*Bow and Arrow*.—The attitude of drawing the bow, as represented in figure 4, is well adapted to exercise and develop the muscles of the chest and back, and to secure an erect form.

FIGURES 5 and 6.—*Shuttlecock and Battledoor*.—This game consists in keeping the shuttlecock, which is a small ball ornamented with feathers, constantly tossing and re-tossing in the air without coming to the ground.

FIGURES 7, 8 and 9, represent different attitudes in a kind of Calisthenic exercise, which may be practiced alone or in concert in schools.

FIGURES 10, 11, 12, 13, 14 and 15.—*Exercises with the Wand*.—The different attitudes which are assumed in the use of the wand are here represented. In exercises with the wand, the muscles of the arms, chest and back are brought into use in a manner admirably adapted to secure elegance and symmetry of form and to promote muscular strength.





longed after the perspiration has started forth in gushing streams from every pore, and the body is fatigued and exhausted. Ladies who will frequent such assemblies, can never be expected to dress in any other than the most imprudent manner imaginable, with portions of the person wholly unprotected, and the vital organs so bound up that the least motion disturbs the action of the heart and lungs, which can perform their functions with difficulty, even when perfect rest is enjoyed. While the body is in this condition, there is every now and then an exposure to currents of air, and always to a ride or walk in the night, at that late hour, when it is said to be coldest and darkest, and when all power of resistance is exhausted by fatigue. Those who dance for exercise should do so in a loose dress, in a cool, well-ventilated room, or in the open air, with the attendance of only a few friends. The exercise should not be continued till fatigue is induced, or till profuse perspiration ensues. Two hours each day is abundance to be spent in this manner.

CALISTHENICS is a name given to a gentler sort of gymnastics suited to young ladies. They are admirably adapted to produce vigorous muscles, graceful motion, and symmetry of form. The triangle, hoop, ball, dumb-bells, horizontal bar, bow and arrow, nine-pins, and the various exercises represented in PLATE VII., are all appropriate means of exercise for girls or young ladies. Skipping the rope is also highly useful, but the author has known several young persons who have been very much injured by continuing this exercise too long, in a foolish attempt to excel in skipping a great number of times without stopping. Every seminary or school for young ladies should be provided with broad open grounds for fair weather, and open verandas or large halls for damp days, together with a liberal supply of instruments for exercise. There should be as great a variety of amusements as possible—the more, the better. Aside from the expense of the building and

necessary grounds, the cost of a liberal supply of instruments for exercise must be a mere trifle, compared with the benefits to be derived from their use. During the spring, summer, and autumn, girls and young ladies should be encouraged to engage in horticultural pursuits, or to ramble in the open fields or forests, where these are accessible, in search of wild flowers, minerals, and other objects of scientific research or of curiosity.

Parents and teachers cannot be too deeply impressed with the imperative necessity of securing a large amount of active exercise to young ladies, between the ages of twelve and twenty, when the osseous and muscular systems are acquiring strength and development. At the age of twenty, the bones and muscles in both sexes have nearly attained their full size and strength, and the form has acquired its due proportions. According to the highest medical authority, three-fourths of the young ladies at the age of twenty in the best classes of society have more or less curvature of the spine, and there are at this age no less than nine cases of lateral curvature of the spine among females for every one among males; and yet, so long as girls are allowed to indulge in the same exercises as boys, their forms are quite as symmetrical and perfect as those of the opposite sex. It is equally true, that among those nations where the females participate with the males in their out-door labors and sports, spinal deformity is very rare.

But whenever girls are brought under the dominion of the prevailing fashionable ideas of woman-like deportment, there is a marked deterioration of the general health, and especially of the osseous and muscular tissues. The muscles become small and weak from inaction, and the bones slender and frail. The muscles of the back are the first to fail, both because they are seldom exercised, and because the dress is usually such that they cannot be exercised to any advantage when there is an opportunity for their use. As a natural consequence, the muscles become too slender and feeble to support the weight of the head



P L A T E V I I I.

CALISTHENICS AND SPINAL CURVATURE.

FIGURE 1.—*Horizontal Bar*, used for the purpose of *Swinging by the hands*.—This exercise requires a large amount of strength, and should be practiced for only a few minutes at each exercise.

FIGURE 2.—*Weight and Pulley*.—This exercise, which consists in raising a weight by means of a rope drawn through a pulley, is specially adapted to strengthen the muscles of the side and back. It is most useful when the muscles of one side are weaker than the other.

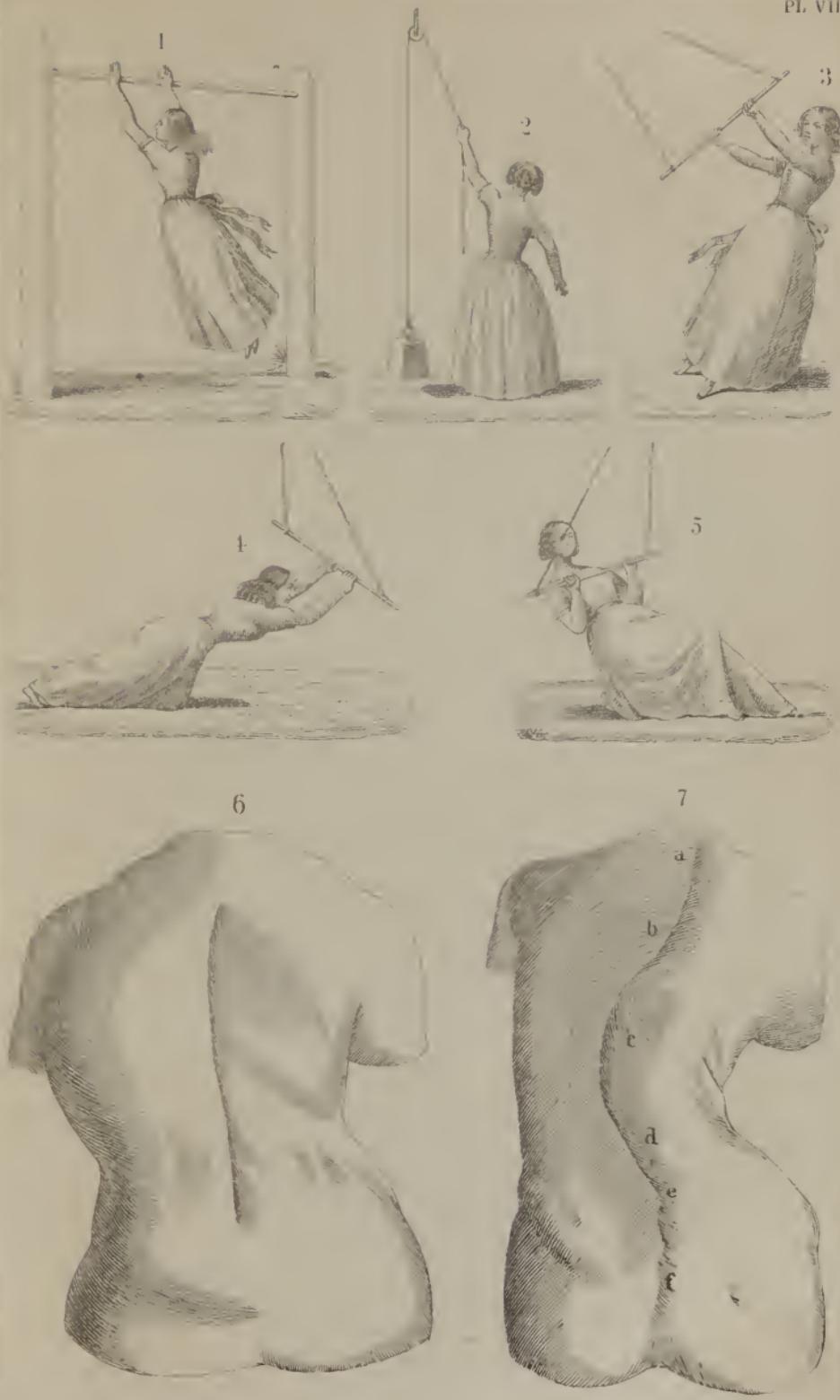
FIGURE 3.—*The Triangle*, consisting of a straight bar, supported at each end by a rope passing over a pulley.

FIGURE 4.—*Bending forward with the Triangle*, so that the weight rests upon the hands and the toes.

FIGURE 5.—*Bending backward with the Triangle*, and supporting the weight by the heels and the hands.

FIGURE 6.—*Incipient Lateral Curvature of the Spine*, indicated chiefly by a slight prominence of one shoulder and hip.

FIGURE 7.—*Confirmed Curvature of the Spine*, representing the form of the italic S, instead of a perpendicular column. From a to b and from e to f, the cartilages, and perhaps to some extent the bones, have been absorbed on the left side, and from e to u on the right, till they have become wedge-shaped.



and the spinal column, and permit the spine to deviate from its true upright form. Lateral curvature of the spine commences, in a great majority of cases, in muscular weakness, and becomes permanent only when the bones and cartilages have changed their form. At first, the curvature is very slight, and can be detected only by the closest inspection. Some idea of the general appearance of the form may be derived from *fig. 6, PL. VIII.*, where the spine appears slightly bent from a perpendicular, and one shoulder more prominent than the other. In this stage of the deformity, the evil may in a majority of cases be easily remedied by attention to the attitude in sitting, walking, and reclining, and by a proper exercise of the muscles of the chest and back; but when these means of prevention are neglected, the deformity rapidly increases, till the form becomes unsightly and repulsive, as represented in *fig. 7, PL. VIII.* In this case, the cartilages, and, to some extent, the bones from *a* to *b* have been absorbed on the left side, and those from *c* to *d* on the right, and again those from *e* to *f* on the left, till they have gradually assumed a form adapted to their unnatural position, and the deformity become permanent. The only reliable hope of preventing an evil so much to be dreaded in females, is in a most careful attention to all the means which promote the general health, with a daily resort to such exercises as strengthen the muscles which support the spine. Nearly all the exercises included in gymnastics or Calisthenics, are useful in preventing spinal curvature.

The exercises represented in *figs. 1, 2, 3, 4 and 5, PL. VIII.*, are specially adapted to prevent this undesirable deformity, by strengthening the muscles of the back. An apparatus, dignified with the name of "*Jack in the Pulpit*," may be so constructed, as to combine amusement with the right kind of exercise. The weight consists of an image, in which there is concealed a coil spring, and the whole inclosed in a box. The exercise and the amusement consist in drawing the image from the box, and the distance

to which it is elevated must depend on the strength of the operator. Exercises with the wand, or in swinging weights over the back and shoulders, from right to left and from left to right, backward and forward, are highly useful to the chest as well as to the lungs. The dumb-bells or any common weight may be used in this way; and, if nothing better be at hand, a chair will answer a very good purpose.

The value of a good form to a young lady cannot be estimated: it is only second to life itself. All the accomplishments of the age cannot counterbalance it, nor can health and personal beauty exist without it. The displacement of the spinal cord and its nerves, must of necessity be more or less prejudicial to health. It is well known by physicians that those females who have curvatures, are more or less subject to spinal irritation, and are seldom exempt from that legion of physical ills which are properly known as "*nervous complaints*." The mantua-makers of the present day are so well skilled in the art of padding, that any slight deviation from the natural form may be unobserved by the masses; but the physical condition which admits of a deformity, except from mechanical causes, and the subsequent consequences of the deformity itself, are constitutional vices, which sooner or later, in one form or in another, will be followed by their natural retribution. Persons of weak muscles or of distorted bodies are for the most part strangers to the grateful impulses of full health. They may not always be on the sick-list, but they seldom enjoy vigorous and robust health.

Attention to exercise, however, does not embrace all that is necessary to secure a perfect development of the form: the habitual position of the body is not to be neglected. In standing, walking, sitting, and lying in bed, the habit of inclining to one side, or of bending forward, will very soon change the form of the growing young, notwithstanding the muscles may be strengthened by the proper amount of exercise,

TIME FOR EXERCISE.

The best time for exercise and recreation is in the morning or early part of the day, when the air is pure and invigorating, and the powers of the body not exhausted by fatigue or excitement. The morning is also the best time for study; and many students indulge in the feeling that the early part of the day is too valuable to be lost in exercise; therefore they wholly neglect morning exercise, or defer it till the mind has become fatigued and the nervous system so far exhausted as to impart but little energy to the muscles. Under such circumstances, exercise very soon becomes a drudgery, and fails to impart health and vigor to the system. Exercise immediately before meals, to the extent of inducing fatigue, instead of improving the appetite, exhausts the nervous energy, and unfits the digestive organs for the reception of food. The most appropriate hours for students are soon after breakfast, and an hour or two before twilight. Invalids should avoid the dampness of the early morning and evening, and in summer the heat of mid-day, and select that portion of the day at each particular season of the year when the temperature will be the mildest and the most agreeable. In the early Spring, the afternoon, though regarded as the most pleasant, is often the most objectionable part of the day, from the fact that the air is saturated with vapor, and the liability to contract colds is greatly increased thereby.

AMOUNT OF EXERCISE.

The amount of exercise proper for each individual, depends mainly on the capacity to endure muscular effort without fatigue. An invalid, whose health has been impaired by sickness or disease, or a student, whose strength has been lost by his sedentary habits, cannot be expected to endure with impunity the same amount of muscular exertion that another person can, whose health

and muscular strength are in full vigor. For this reason, invalids should take at first passive exercise in an easy carriage, and then resort to something more severe, as the strength and the capacity for muscular effort increases. Students and literary men, who have sufficient bodily strength to take exercise, should spend from two to four hours each day in exercise and recreation. Not less than two hours should be devoted to most active muscular effort in active games, in gymnastic exercises, in rowing, or in manual labor. Walking is not sufficient exercise, unless it be after the rate of English university students—eight miles in less than two hours. Two hours of such walking is as good as six spent in sauntering along the streets at the slow pace of star-gazing lovers. The amount of exercise which a student takes is, therefore, not to be measured by the time he spends, but by the amount of muscular efforts actually put forth. Two hours of daily exercise that will rouse the nervous system, quicken the pulse and respiration, and send the vital fluid to every tissue with new force, opening the pores for a copious perspiration, will suffice, with an equal amount of time in some amusing recreation, to make any ordinary student healthy and vigorous. If the students in our colleges would spend more time in active, wide-awake, out-door exercise, they would come out of college *living men*, and noble specimens of the race, instead of being, as a majority are, the mere outlines and shadows of men. No persons in any callings are in better circumstances to secure health, and attain a perfect development of all the powers, than students; and yet, for the most part, the close of each term finds a majority puny and feeble, if not actually sickly, and any thing but fine-looking young men, such as are seen at an English or a German university. American students have yet to learn that, if it requires much patient study to find the key of knowledge, it also requires habitual exercise of the muscles to use it, and much energy and power to ascend the golden heights.

of the inner temple of science. A student or a professional man of limited health must also be limited in his intellectual attainments. The mind must very early partake of the feebleness of the body, and be limited in its capacity for labor, or the frail body must seek its rest in a premature grave. A sufficient amount of active exercise should therefore be taken by students and literary men, to secure permanent and vigorous health, in order to be successful students or useful members of society.

CHAPTER XI.

BATHING.

ANTIQUITY OF BATHING—STRUCTURE OF THE SKIN—ADVANTAGES OF BATHING—DIFFERENT KINDS OF BATHS.

THE practice of bathing is of great antiquity, and has been resorted to in every stage of society for the purposes of cleanliness and health, or as a recreation and luxury. The ancient Hebrews, Greeks and Romans all practiced ablutions. Among the Persians, Arabs and Hindoos, baths were employed as a means of cleanliness and recreation at a very early period. The bathing establishments of the Romans were constructed with surpassing elegance and splendor, and at an immense cost to the public treasury. When they were in their highest perfection, it is supposed that eighteen thousand persons might have been bathing at once, and been provided with all the varieties of the cold, hot, tepid and vapor baths. When Alexandria was plundered in 640, there were no less than four thousand public baths, which were supposed to have been constructed in imitation of those at Rome. At the present day, the vapor-bath in Russia is general, from the emperor to the lowest serf; and there is hardly a hut in all the dominions of the autocrat that is so destitute as not to possess its family vapor-bath. In Turkey, Egypt and Persia, the habit of resorting to the bath as a luxury is general, from the

pasha down to the poor camel-driver. In fact, all the nations of Continental Europe and many of the uncivilized tribes of Asia greatly excel the otherwise more refined English and Americans in their establishments for securing personal cleanliness. As a people, it must be confessed that the Americans are proverbial for their neglect of personal cleanliness. Most of our cities have no public establishments for bathing, adequate to meet the wants of the masses, and a great majority of our public houses, though amply provided with every thing else desirable, are wholly destitute of means for furnishing their guests with the convenience and luxury of a bath. Still, it cannot be denied that the utility of bathing, as a means of promoting health, has been most abundantly established by various nations in all ages of the world, and in every variety of climate; and it may well be asked, why should the people of the United States deprive themselves of a luxury so highly conducive to health and happiness?

STRUCTURE OF THE SKIN.

The necessity of frequent bathing arises mainly from the peculiar structure and function of the skin. The skin is composed of two principal coats—the *cuticle* or scarf-skin, and the *cutis* or true-skin. The cuticle is formed of numerous flattened cells or disks, which are constantly falling off in the form of minute powdery scales, and being reproduced. The scarf-skin, having no nerves and blood-vessels of its own, is useful mainly as an envelop or protection to the true-skin. The true-skin is formed of numerous minute blood-vessels and nerves, which render it highly delicate and sensitive, as any one can testify who has had it denuded by a blister or a burn; and it has in charge the important function of acting as a special hand-maid of the lungs in purifying the blood. The scarf-skin is perforated by numerous small openings or pores, through which the watery vapor, carbonic acid, and effete animal matter excreted by the true skin, are constantly escaping to the surface.

It is estimated that there are no less than seven millions of pores in the skin of an ordinary-sized man, and that there is daily an exhalation through these of from two to three pounds of waste matter. The excretions of the skin are, however, by no means uniform in quantity, since they must of necessity vary with the temperature of the air, the amount of fluid taken, the habits of exercise, and various other circumstances. As a general estimate, the excretions of an adult will not be less than thirty-two ounces each day. Of this the largest proportion is an imperceptible vapor, termed "*insensible perspiration*," but nearly one per cent. consists of solid substances, which are the products of the decomposition constantly taking place in the tissues. The peculiar odor of perspiration is owing to the effete matter which it contains. When the perspiration is checked, from cold or an unhealthy condition of the skin, the whole of these noxious matters fail of being removed, and are accumulated in the blood and the more delicate tissues, and ultimately produce disease, unless under favorable circumstances they are separated from the blood by the liver, the kidneys and the lungs. But it is quite obvious that these organs cannot perform the extra labor without disturbing the equilibrium of health, and inducing exhaustion and ultimate disease of their own structure.

ADVANTAGES OF BATHING.

Thus habits of uncleanliness are not unfrequently the incipient cause of serious disease of the vital organs. The natural excretions, together with the exfoliations of the scarf-skin, form a coating of foreign matter over the entire surface of the skin, and effectually close up its pores and obstruct its appropriate functions. This thin pellicle of animal impurities not only confines within the system substances which are actually poisonous, but becomes itself the seat of detention of foreign impurities, which here find a resting-place till they are absorbed into the system.

Ablution is therefore a necessity—not a mere luxury, which may be indulged in or omitted at pleasure. Persons may occasionally live in total neglect of this, as of other means of promoting health, and yet escape disease for a time; but an impure skin will in the end be found incompatible with uniform and lasting health.

Aside from the absolute necessity of water as a purifier of the skin, all persons esteem it as grateful and refreshing when applied to the hands and face, and, in those accustomed to its use, it is equally refreshing to the whole body. The oriental custom of offering water for washing, as the first act of hospitality to the weary traveller, is worthy of our admiration. Even food to the hungry is scarcely more refreshing than the bathing of the wearied limbs with water. When applied to the skin, it produces an instantaneous contraction of the capillary vessels, forcing out their contents, and admitting a new supply of blood. An impulse is thus given to the whole circulation, while new tone and vigor is imparted to the capillary and nervous systems. Water to the skin is thus one of the best of tonics. It relieves internal congestion, calms mental excitement, quiets nervous irritability, carries off feverish heat when it exists, and equalizes the circulation.

When we consider the uses of water to the person alone, it is not strange that, in an age “when man drew his luxuries more from nature and less from works of his own—when water was his friend more than his servant—water was regarded as a representation of the Deity, and was raised to the dignity of a mythological god. Thus the rivers of Greece and Rome were represented allegorically by a tutelar god with his attendant nymphs, and to this day the Ganges is adored by the votaries of Brahma. Baths were dedicated by the ancients to the divinities of medicine, strength and wisdom—namely, *Aesculapius*, Hercules and Minerva, to whom might properly be added the goddess of health, *Hygeia*. The use of water has been adopted as one of the symbols of Christianity.”

DIFFERENT KINDS OF BATHS.

Water is applied to the skin in a variety of ways, according to the fancy and convenience of each individual, and according to the purpose to be accomplished by its use—by immersion, a plunge, a douche or a shower. The most simple and natural division of baths, in regard to temperature, is into cold, warm and hot. These terms, so far as our sensations are concerned, are merely relative, and cannot be fixed uniformly at the same temperature.

Water of eighty degrees would produce a sensation of pleasant and agreeable warmth to the hand immediately after exposure to a lower temperature; but if applied to the body at the same temperature, it would produce a decided impression of cold. We can therefore assign only certain general limits to each kind of a bath. A full bath, under eighty-four degrees would be regarded as cold by most persons; from eighty-four to ninety-two, tepid; from ninety-two to ninety-eight, warm. Most persons, under ordinary circumstances, will assent to the following divisions—namely: for the cold bath, under eighty-four; for the tepid, from eighty-four to ninety-two; for the warm bath, from ninety-two to ninety-eight; and for the hot bath, any temperature over ninety-eight degrees. A medium temperature for the tepid bath will then be eighty-eight, and for the warm, ninety-five degrees. The cold bath is usually taken at about the same temperature as the air of the apartment, and may be applied either by a plunge, a douche, or with a sponge.

The plunge-bath is very agreeable in a warm apartment, or in the open stream in warm weather, and affords a highly-useful means of cleanliness, recreation and exercise, when accompanied with swimming or when followed by liberal friction. Swimming, for most persons, is a very agreeable and active exercise, and a valuable accomplishment for all. In the act of swimming, the respiration is accelerated, and nearly all the muscles of the body are

brought into active exercise, and the capacity to evolve animal heat greatly increased.

Persons who swim or take active exercise in the bath, resist the operations of the cold, and experience a salutary reaction and glow, much better than those who are inactive. The douche, which consists in pouring a large stream of water on the whole person or on a particular part, is useful mainly when it is desirable to gain a decided shock, and is usually applied only to a particular part. The shower-bath admits of considerable variety, both in its application and its effects. It may be applied gently in small streams, or with great force and in large streams. Many of the portable shower-baths, as offered in the shops, contain large apertures, which allow the water to fall in torrents, and few persons have the courage or ability to endure the force, it being more like a hail-storm than a gentle, refreshing shower. The shower-bath should be so constructed that the streams shall be small, and easily controlled at the pleasure of the bather. When properly conducted, we can testify from our own experience that the shower-bath is a most delightful means of promoting health. It gives a general shock to the whole system, and is followed by a grateful glow of warmth and a general activity of the circulation. For those who can bear it, the shower-bath is to be preferred to all other forms of cold bathing. The quantity and force of the water should be under the control of the bather, and the apartment should be so arranged that the whole or only a part should be exposed to it at pleasure. The sponge-bath is to be recommended for its convenience and universal presence. It can always be enjoyed at home and abroad, and when faithfully applied it is a highly salutary and agreeable bath.

On the application of cold water to the surface of the body, by either of the above methods, the skin immediately shrinks, and the whole of its tissues contract, diminishing the diameter of the cutaneous vessels and their capacity for blood. A portion of the blood circulating

near the surface is thus suddenly thrown in on the deeper parts, and especially on the internal organs. This sudden change in the order of things stimulates the nervous system, and thus rouses the heart to more energetic action to relieve the internal organs by sending back the blood to the surface. As the warm blood comes rushing back to the surface, a general glow of warmth is experienced throughout the whole system. There is a general redness of the surface, the mental faculties are clear and strong, the senses are acutely alive to all external impressions, the appetite is sharpened, and the whole organism invigorated. This highly desirable state is what is called a healthy reaction. When this does not take place, the surface becomes cold and bloodless, the heart and circulation languid, and the mental faculties dull and depressed. Under such circumstances, the associations connected with the bath are disagreeable and forbidding. With a proper reaction, nothing can be more refreshing and grateful to the feelings than a generous bath. Without it, nothing is more unwelcome or more to be dreaded. In one case, the cold bath is a highly useful means of promoting health; and in the other, it is as decidedly pernicious. The aged, the invalid, and the bloodless, who have not sufficient vigor to secure a healthy reaction, cannot resort to the cold bath with impunity. But with the opposite and more fortunate class, it is not only a luxury, but a most valuable means of invigorating the health and strengthening the constitution to bear with impunity exposure to cold and sudden changes of temperature. For the most part, those persons who practice daily ablution in cold water, are but seldom subject to colds and fevers, and when they are, they recover much sooner than others. The ability to practice cold bathing is in part the result of training. The bather at first uses tepid water, and gradually becomes accustomed to a lower temperature, till the cold bath comes to be preferred to any other. The uninitiated should therefore commence with water at an agreeable temperature, and

gradually diminish it till they can bear the water at the same temperature as the surrounding air.

In the tepid bath, the shock is milder than in the cold, and the reaction less marked. It is therefore to be preferred by those who have not sufficient vigor to endure cold bathing. The precise temperature of the tepid bath may be regulated according to the feelings of the patient.

The best time for the cold or tepid bath is early in the morning or about an hour before dinner. Persons in health will usually prefer the bath immediately after rising in the morning, since it occupies less time than at any other hour. Invalids and persons of leisure will find the bath more agreeable three or four hours after breakfast. Bathing immediately after taking a full meal interferes with the process of digestion, and has a tendency to divert a portion of the nervous energy from this process, while the nervous and vascular excitement which constitutes a healthy reaction is less perfect than where digestion is completed. The capacity for a healthy reaction is also diminished by mental or bodily fatigue, to an extent that renders the cold bath wholly unsafe after the body has become weary by labor, or the nervous system depressed by mental effort. Mental excitement, an evening debauch, and unusual fatigue, are circumstances which render the cold bath improper on the following morning, even though the individual may have been in the habit of using it daily. When the circulation is languid and the skin cool, or when there is any unusual depression of the vital energies, the cold bath ought to be postponed.

The duration of the cold bath should not be over ten minutes, unless it is accompanied by swimming or active exercise, when it may be continued as long as it is found to be pleasant and agreeable. Invalids and persons whose capacity for reaction is feeble, should not spend more than two or three minutes in the bath, and they should then be enveloped in a warm blanket, or speedily dressed in warm clothing.

The warm bath has a soothing, tranquillizing effect on the whole system. It quiets the circulation and calms all nervous excitements by equalizing the circulating fluids and producing a general equilibrium. The bather experiences a most delightful consciousness of comfort and well-being, and an inclination to repose, without any feeling of inability for mental or bodily exercise. The warm bath is specially grateful to the weary and fatigued, and is an efficient means for the relief of internal inflammations, congestions, fevers, and colds. For children that are nervous and irritable, from teething or other causes, the warm bath is one of the best anodynes that can be administered. It diminishes the animal heat, calms the nervous excitement, and disposes to quiet, refreshing sleep. The hot bath acts as a stimulant, communicating heat to the body, increasing the heart's action, and producing a high degree of nervous excitement. If it be continued for any great length of time, it is followed by a feeling of prostration, amounting to fainting, and even apoplexy, when the bath is indulged too long. The hot bath is useful chiefly when a decided impression on the circulation and the nervous system is desired.

The vapor-bath does not differ essentially from the warm bath in its physiological effects. It stimulates the cutaneous circulation, determines the blood to the surface, and causes an increased activity of the functions of the skin. When the skin is dry and harsh, the vapor-bath is to be preferred to all others, since it softens the cuticle, and produces exfoliation more perfectly than any other. It is a very valuable means for the relief of colds and inflammations, and is a great luxury to the weary and fatigued. It equalizes the circulation, and is highly refreshing and invigorating. From the increased activity it imparts to the cutaneous vessels, immediate exposure after its use is less liable to be followed by colds than after the warm bath by immersion.

Transition baths are those in which there is a quick pass-

age from a warm or hot to a cold medium, whether vapor or water. In the Russian bath, the bather enters a warm room, filled with vapor produced by pouring water over red-hot stones, and remains till the body is in a profuse perspiration, and then rushes forth to roll in the snow or plunge into the nearest stream. When neither is accessible, he cools himself by affusions of cold water, pouring over his head a bucketful at a time. The heat of the bath is seldom less than one hundred and twenty degrees Fahrenheit, and is often as high as one hundred and forty. The transition baths of the ancient Romans must have been nearly the same in effect as the Russians of the present day. These abrupt transitions of temperature may seem almost incredible to those who have fallen into the error of supposing that the liability to contract colds is increased by the warm bath. The fact, however, is that the power of resisting cold becomes greater in proportion as the animal heat is above the natural standard. After exposure to the intense heat of the high temperature of the Russian bath, there is a state of nervous and vascular excitement and a degree of animal heat which enables the bather to bear with impunity the sudden application of cold, and part with an amount of heat which, under other circumstances, could not fail to be injurious. When the application of cold is carried just far enough to reduce the animal heat to a medium temperature, the effect on the system is most salutary and delightful. The previous excitement is now followed by a most grateful calm, the pulse is restored to the equilibrium of health, the mind is clear and active, and every part of the body refreshed and invigorated. As a relief to a cold or the premonitory symptoms of a fever, the efficacy of the warm bath is unquestionably increased by a sponge, a shower, or a douche. Under any circumstances, most persons will find the warm bath more agreeable and more useful when the excitement and the animal heat derived from the bath are relieved by the application of cold water; though it is very doubt-

ful whether the high temperature of the Russian bath is not exhausting to the system, if often repeated, notwithstanding the transition to the cold bath so soon restores the equilibrium of animal heat. But a bath at about blood-heat, followed by a cold showering or sponging, is free from this objection; and while it is certainly very grateful to the feelings, it is also highly salutary as a means of promoting health, as the author can testify from personal experience.

The warm or vapor bath may be taken at almost any hour of the day, except after a full meal, though the hour before retiring to bed is usually preferred, on account of there being less subsequent exposure at that hour than at any other. A much longer time may be spent in the warm bath than in the cold—from fifteen to thirty or even forty minutes, according to the feelings and constitution of the individual.

The frequency of bathing is to be determined by the age, constitution, and habits of life of the individual. The aged, in whom the vital functions are less active, and the vital powers less vigorous, will find two or three times a-week often enough to resort to the bath for the purposes of health. Children should be bathed daily the first year with warm, during the second with tepid, and subsequently with cold water. The practice of bathing infants in cold water is attended with very great risk. Children that are remarkably protected by flesh, or who have inherited hardy constitutions, may endure the exposure with impunity; but for the slender and feeble it will, in a majority of cases, prove decidedly pernicious, if not fatal to life. For the purposes of health and cleanliness, the warm bath need not be resorted to oftener than two or three times a-week by adults. Persons in full health ought to practice bathing every morning on rising from the bed, as part of the duties of the toilet. Daily ablution contributes not only to personal comfort, but it is a most salutary means of fortifying the system against colds, fevers, and many diseases to which we are otherwise

exposed. There is a very close sympathy between the skin and the nervous membrane of the alimentary canal; and those who preserve the skin in a clean, healthy and vigorous condition, will find themselves abundantly rewarded by exemption from many gastric and intestinal complaints to which others are liable.

CHAPTER XII.

VENTILATION.

THERE is no subject, directly connected with the preservation of health, in reference to which there is so much popular ignorance and indifference as ventilation. All men understand the necessity and importance of providing for themselves food and drink; but for air, the essential element of existence, they make no provision: yet men have been known to live five weeks without food, but a person wholly deprived of air will not live five minutes. We have no appetite and no instinctive impulses which protest against an insufficient supply of air, as against want of food and drink; nor do we realize that bad air is a slow poison, the breathing of which as surely injures the health, as the habitual use of arsenic, prussic acid, or any other poison. Our indifference, in a matter of such vital importance, can be accounted for only on the supposition that we are slow to believe that we can be injured by any agent which does not produce an immediate and sensible effect. But it is nevertheless true that the breathing of impure air is a fruitful source of impaired health and disease. Air which has been breathed over and over again in our parlors, sleeping apartments, school-rooms, public halls, and churches, becomes charged with the dead animal matter which is constantly given off by the skin and lungs, and with carbonic acid gas, the natural product of respiration, and is as truly poisonous as the most loathsome substance in nature. Air thus poisoned is as unwholesome

PLATE IX.

VENTILATION.

FIGURE 1.—*A Room ventilated only by a Fire-place.*—The cold air enters the windows, is drawn along near the floor, and then carried up the chimney by the draught. The air in the upper part of the room remains unchanged.

FIGURE 2.—*A Room with an Open Fire and a Chimney-valve.*—*a*, Fire-place; *b*, The flue; *c*, Chimney-valve.

FIGURE 3.—*A Chimney with a Hollow Back.*—*a*, Hollow space in which the air is received and heated before entering the room.

FIGURE 4.—*Outside of the Chimney, of which figure 3 is a section.*—*a*, Register admitting fresh warm air; *b*, Chimney-valve, for carrying off the impure air.

FIGURE 5.—*Arnott's Chimney-valve.*—*a*, The valve, which is so balanced as to open into the chimney whenever there is a draft, and to close when the wind blows down the chimney. *b*, Outside of the frame, which is even with the wall, and may be painted the same color.

FIGURE 6.—*Mott's Chimney-cap*, open at both ends.

FIGURE 7.—*Exhausting Cowl*, open at both ends.

FIGURE 8.—*Receiving or Injecting Cowl*, open to the wind.

FIGURE 9.—*Emerson's Exhausting Ventilator.*

FIGURE 10.—*Emerson's Injecting Ventilator.*

Fig. 1.

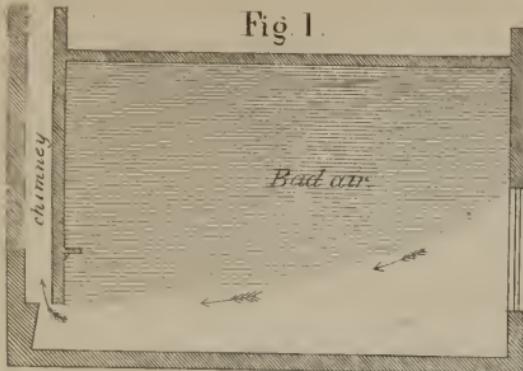


Fig. 2.

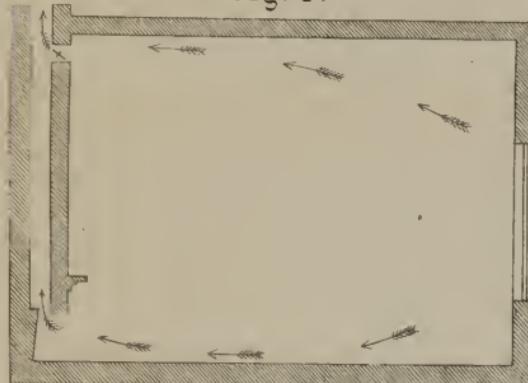


Fig. 3.

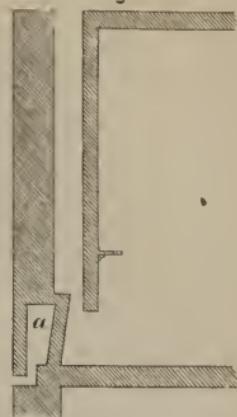


Fig. 4.

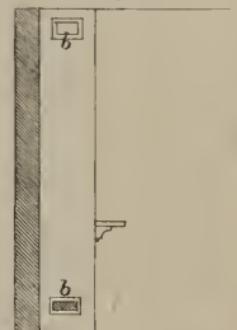


Fig. 5.

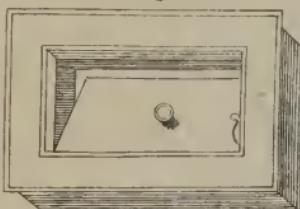


Fig. 6.

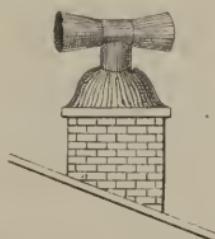


Fig. 7.

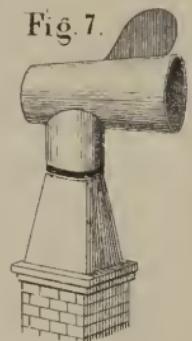


Fig. 9.

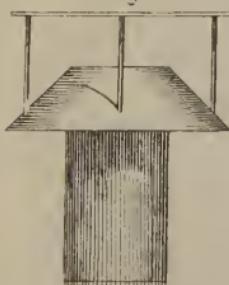


Fig. 10.

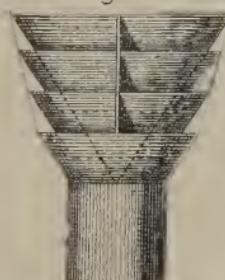
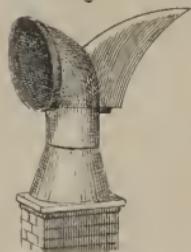


Fig. 8.



for the purpose of respiration, and would be as repulsive, if our senses could appreciate it, as decayed animal flesh for the purpose of mastication and digestion.

It is now well established that one of the common causes of typhus fever is the effete matter of the human body, accumulated and long retained in private dwellings. Let us suppose a family, (of which there are thousands of examples,) consisting of ten adult persons, dwelling in a small, ill-ventilated house. On the supposition that they all spend twelve hours out of the twenty-four in the house, the amount of effete matter thrown off by the lungs and skin within their dwellings would be five hundred pounds in one month, and three thousand pounds in six months. The greater part of the excretions consist of carbonic acid and water. But the amount of animal matter which has once performed its functions in the tissues of the body, and has been decomposed and thrown out of the body as dead matter, is no less than six pounds and three ounces in one month. Typhus fever, dysentery, and the cholera, when they prevail as epidemics, not unfrequently take their origin in the impure air which is breathed in camps, in the holds of emigrant ships, and in the abodes of squalid poverty. Though these malignant diseases may not often be generated spontaneously in the unventilated apartments of the affluent, still the health may be gradually impaired, and the seeds of disease insidiously implanted in the constitution. The blanched features, the pale and cadaverous countenance, and the impaired health, with which multitudes come forth from their winter-quarters in the spring, testify very plainly to the pernicious influence of bad air.

The importance of a due supply of pure air, as an essential element of healthy respiration, having been considered in the chapter on Respiration, our attention must now be directed to the best modes of securing it.

In order to ventilate a room, there must be something to cause the impure air within it to be exchanged for fresh air from without. The simplest and most common

plan of ventilating, and at the same time heating rooms, is by means of the chimney and an open fire-place. It is well known that air, whenever heated, becomes lighter, and rises. When a fire is kindled in a fire-place, a column of air, the size of the flue, is heated, and made to rise with a rapidity proportionate to the amount of heat, and thus a draft is continually made from the air of the room.

To supply the vacancy thus made in the air of the room, fresh air from without is continually coming in through crevices and openings about the windows and doors. When the chimney-flue and fire-place are large, and the openings about the windows and doors sufficiently abundant, there is a good ventilation; but where an open grate or an open stove is used, and the carpenter-work of the house is more perfect, the ventilation is much less. But when, instead of an open fire, a close stove is used, the same air is heated over and over with but very little exchange for pure air from without. Still, we do not regard even the open fire as affording a complete system of ventilation: the cold air which comes in at the windows, being colder than the air in the room, falls to the floor, and is constantly drawn to the open fire and up the flue, while the heated air of the upper part of the room remains impure and unchanged by the currents of air which are constantly setting from the windows to the open fire, as represented in *fig. 1, PL. IX.*

The air, as it is exhaled from the lungs, is about five per cent. lighter than the air of the room, and of course has a tendency to rise, rather than fall, and is thus accumulated in the higher portion of the room, with no means of escape, except through the open throat of the grate. Thus, the heads of the persons occupying such a room are constantly in a stratum of impure air. And yet there is a very perceptible difference between the air of a room heated by an open fire and a room heated with a close stove.

A very simple and reliable means of ventilating a room can be secured by introducing a chimney-valve or register

in the flue near the ceiling, as represented in *fig. 2*, PL. IX., where *a* is the fire-place, *b* the flue, and *c* the chimney-valve. The impure air in the upper part of the room will pass off through any opening near the ceiling. The upper sash of the window may be lowered for the purpose, but it is liable to this objection, that a current of cold air rushes into the room, equal in volume to the heated air which passes out. When a room heated by an open fire is to be left vacant for a short time, the dropping of the windows may secure a very thorough ventilation; but it very soon cools the room, and is often inadmissible when it is occupied. The chimney-valve on Arnott's plan, represented in *fig. 5*, PL. IX., consists of an iron box with a valve, which is so nicely balanced that it opens with the slightest pressure of air from within the room, and closes against the passage of air or smoke from the chimney into the room. By this simple contrivance whenever the air in the flue is heated, as in winter, there is a constant draft through the valve, which is sufficient to carry off the impure air from any ordinary room.

It is necessary, in order to secure a perfect ventilation, that there should be some reliable means for a constant supply of fresh air from without, and this becomes more important in proportion as the house is tight and well built. In summer, a register through the walls of the house, placed near the floor, will be found very pleasant and convenient, especially for sleeping-rooms; but in cold weather, it will be found more economical, as well as more agreeable, to introduce a supply of fresh air which is already heated. This may be accomplished in several ways: the chimney may be so constructed as to admit air behind the bricks or lining of the grate or fire-place, and the hollow space to be controlled by a register or an open slide—*fig. 3*, PL. IX.

Several patterns of ventilating stoves have been invented to secure the same object, but they are not as agreeable or as healthful as an open fire. Where, how-

ever, this cannot be had, a very simple ventilating-stove may be constructed by enclosing almost any stove in a cylinder of sleet-iron or zinc—fresh air being introduced at the bottom, and allowed to escape through perforations at the top or by a register which can be controlled. Instead of a plain cylinder, the outside case may be highly ornamented, or constructed in the Gothic or any other style to please the fancy."

Where it is desirable to warm large rooms in public buildings, or several rooms in a private house, hot-air furnaces are now very generally preferred; but they are liable to very serious objections when not properly constructed or properly managed. Many of the heaters now in use present so small a surface for the air to pass over, that the iron must necessarily be raised to a red heat to afford sufficient warmth for ordinary dwellings. Air that is thus heated becomes exceedingly unwholesome, if not poisonous. According to Dr. URE, cast iron contains, besides the metal itself, more or less carbon, sulphur, phosphorus, and even arsenic; and it is more than probable that the languor, head-ache, and depression experienced from breathing furnace air, may be owing to the noxious gasses which are given off by these poisonous substances.

Another objection to many furnaces is, that the quantity of air which they furnish is so small, that it must necessarily be raised to a high temperature to afford a sufficient amount of warmth. The air ought not to be heated to a higher degree than one hundred and twenty or one hundred and thirty Fahrenheit. When the air is introduced at a higher temperature, it is not only unwholesome, but it gives rise to currents of air in the room, and heats some portions much warmer than others.

In all apartments heated by hot-air furnaces, there should be some provision for exhausting the air from the lower as well as the upper part of the room. The air introduced from the furnace at a temperature of only one hundred and twenty degrees, is so much lighter than the

air of the room at sixty-five or seventy degrees, that it must of necessity rush to the ceiling, and form a stratum of heated air in the upper part, about or above the heads of those who occupy it. A ventilator near the ceiling can serve no other purpose than to draw off the more heated and leave behind the impure cold air. By exhausting the air from the bottom, a constant change of air is secured, with but very little waste of heat, and with a more uniform temperature than can be secured by any other method. In rooms where no such provision exists, the temperature will frequently be found to vary from one to three degrees for every foot in height. Thus, while the temperature on the floor is only sixty, it will be as high as seventy, and in some instances we have noticed it as high as seventy-five degrees at the height of only four feet. Nothing can be more injurious than keeping the head several degrees warmer than the feet; for while the feet are actually suffering from cold, there will be an excess of blood in the brain, causing languor, head-ache, and cerebral congestions. But this evil can be very easily remedied by exhausting the air from the bottom of the room, either by an open fire or by means of a good ventilator. In either case, the cold air is drawn from the room with the same rapidity that the warm air enters: a constant and delightful change of air is thus going on. By this arrangement, the cold air of the room, instead of being warmed in the ordinary way, is removed, and its place supplied by air that is both pure and warm—securing thereby not only a more wholesome air, but a more economical system of obtaining artificial heat. The object of exhausting the air from a room is not simply to produce a vacuum, but to remove the air which has become impure, and unfitted for the purposes of respiration. By drawing the air from the upper part of a room heated by a furnace, the air most desirable to retain is lost. If the object be to reduce the temperature of the apartment, then an outlet of the hot air from the upper part of the room is appropriate. The air, as it is

exhaled from the lungs, though several degrees warmer, is only about five per cent. lighter than the air of an ordinary room; and it is given off from the lungs so gradually, that it very soon becomes mixed with the surrounding air: so that, were there no currents in the room to cause a mingling of the warm and cold, the respired air would occupy a medium space between the two; but since it is constantly becoming cooler, it will very soon be drawn out with the cold air at the bottom—provided there is a liberal ingress of air which is of a considerable higher temperature than that of the room.

A furnace, to be properly constructed, should have its heater so high above the fire, that it can never become red-hot, and the parts about the grate and fire should be lined with fire-brick. The air-chamber and the pipe for the supply of cold air should be large, in order that such a volume of air should be constantly supplied that it can never be raised to a high temperature before it passes into the room. In cities, where the yards are small and the air close and confined, the air-chamber should receive its supply of air from the top of the building by means of an injector, as represented in *fig. 1, PL. X.* To be agreeable and healthful, the air should not be delivered from the furnace at a higher temperature than one hundred and twenty degrees, though a larger volume of air will be required than is ordinarily obtained from most furnaces. The air may be exhausted from rooms by any means which will secure a draft up the ventiducts. Next to an open fire, Emerson's ventilator is perhaps the most reliable means, except on very still days, when there is not wind enough to secure a draft. A draft may also be secured by building the ventiduct by the side of the chimney, and separating them by a partition of iron, or only the thickness of one brick. Unless the ventiducts are to be heated, a plain board box is the best. Under any circumstances, the openings into the ventiducts should be controlled by a slide or register, which should be about half the size of

P L A T E X.

P L A N O F V E N T I L A T I O N .

FIGURE 1.—*Arrangement of Heating and Ventilating Apparatus.*—*a*, Furnace. *b*, Air-chamber. *c*, Ventiduct supplied with pure air by the injector *d*. *e*, Cold-air duct, from the side of the house, to be used when there is no injector. *f, f*, Hot-air ducts, terminating in the registers, *g, g*. *h, h*, Ventiducts, surmounted by an exhauster, *i*, at the top of the building, on the side, or in the centre at *j*.

FIGURE 2.—*Side View of the Ventiducts.*—*a*, Exhauster. *b, b, b, b*, Valves at the top and bottom of each room.

Fig. 1.

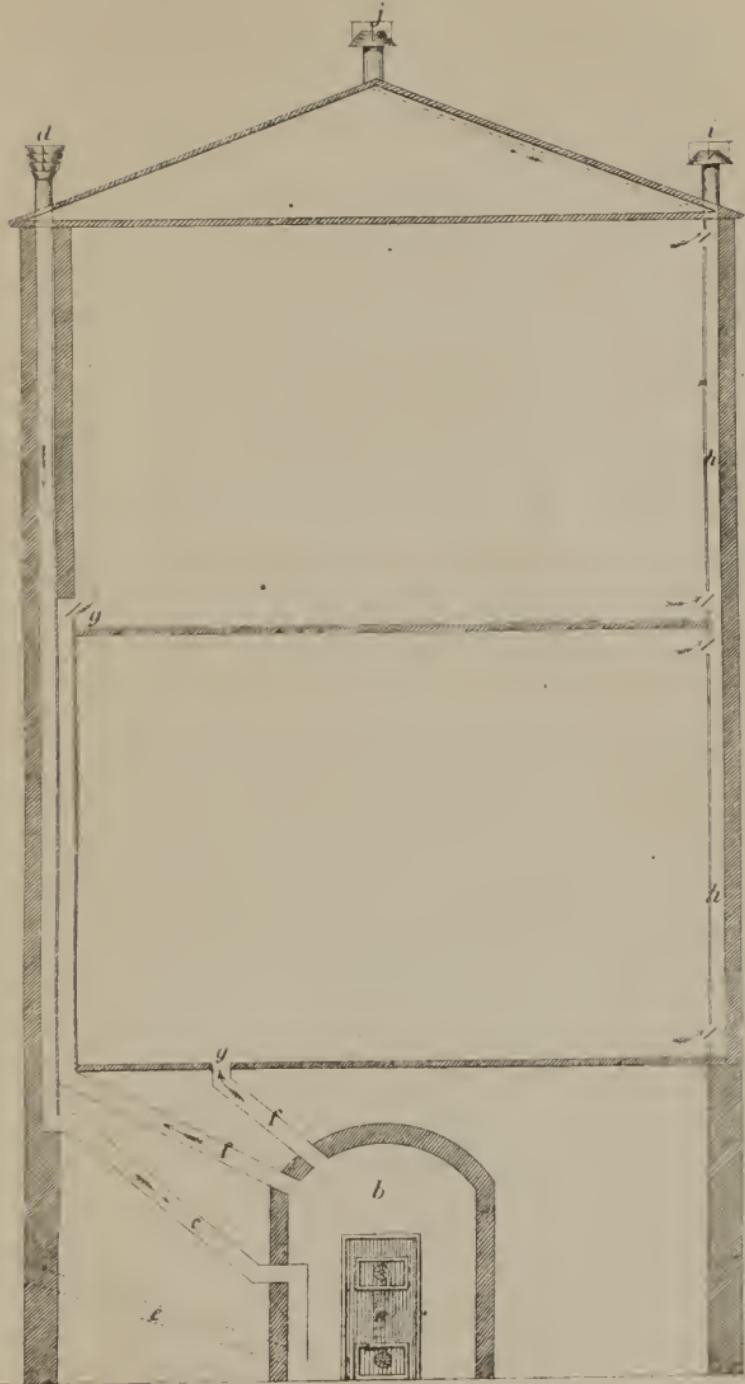
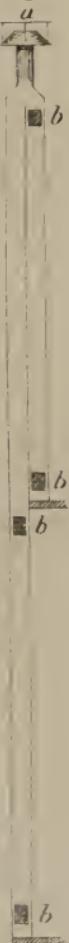


Fig. 2



the register for the delivery of the heated air. This may be highly ornamented, or protected from view by portraits or pictures, which are so hung as to leave a space behind them.

The plan suggested may be seen at a glance by reference to Plate X., where *b* is the air-chamber with the air-warming furnace in the center; *c*, the cold-air pipe, which is provided with Emerson's injector, *d*, securing constantly a supply of pure air. Where there is a free circulation of pure air outside of the building, the injector may be dispensed with, and the air introduced at the side of the building; but in crowded cities, and in situations unfavorable to a supply of pure air, it will be found indispensable. *f, f*, are the warm-air pipes, conveying a constant supply of fresh warm air to each apartment. On the opposite sides of the room are the ventiducts, *h, h*, concealed in the partition, and terminating in the ejector on the roof. The ventiducts have two valves or openings in each room —one near the ceiling and the other near the floor. When it is desirable to warm and ventilate the room at the same time, the upper valve is to be closed and the lower one opened; when it is desirable to cool the room, the upper valve should be opened. The expense of ventilating any kind of a building is very trifling, compared with the value of pure air. In most cases it will not be found to exceed twenty or thirty dollars in a house that costs as many hundreds; and yet, in a great majority of cases, we find expensive dwellings, with every thing supplied that can conduce to beauty or comfort, except pure air. For the most essential condition of vitality, there is no provision whatever. In the construction of shops, factories, school-houses, churches, and public halls, till quite recently, the importance of ventilation has been wholly overlooked. But it is to be hoped that the day is not very far distant when some provision for the supply of pure air will be considered equally as important as windows for the entrance of light. For a more complete detail of the prin-

ciples and means of ventilation than the limits of this work will admit of, the reader is referred to DOWNING'S "*Country House*," BARNARD'S "*School Architecture*," and GRISCOM on the "*Uses and Abuses of Air*."

CHAPTER XIII.

MEDICINES, PHYSICIANS, AND MANAGEMENT OF THE SICK.

BY many persons, medicinal agents are regarded as essential means of promoting health, and it therefore seems necessary briefly to investigate their influence on the animal economy, and make some observations in regard to their proper use. Health, we are bound to look upon as the natural condition of every living being; a condition in which all the vital forces act with uniform harmony throughout the various tissues and organs. This state, however, can be enjoyed only while the functions of the body, and the agents that act on it from without, are in perfect accordance with the laws of vital action in each individual. When there is any departure from that high state of vitality denominated health, either in the due performance of any of the functions, or in the condition of any of the organs, disease is said to exist. Disease is, therefore, an unnatural state, in which some one or more of the organs or tissues are impaired, either in their structure or function. Disease, it is true, may be hereditary, or transmitted from one to another; but it is, nevertheless, a departure from the natural condition, and is an artificial state, brought about, in a majority of instances, by a man's own agency. Nothing can be more absurd than the common notion, that disease is necessarily contingent to our nature; for nature, however depraved in other respects, is faultless in this. The body, with its several organs, will always be in health, so long as all the conditions of vitality are fully supplied.

Equally unnatural to the animal economy is the use of

medicine. It constitutes no part of our natural aliment, and is wholly an artificial agent, brought to our aid for the relief of those ills that our own imprudence and wrong actions bring on us, and therefore can never be said to be natural to man. The necessity of medicine for the human system, is mostly created by man's own wrong-doing. The kind and character of medicine, proper for man, must therefore be ascertained by his own wisdom and experience. The mineral and vegetable world both abound with an infinite variety of agents, that produce almost as great a variety of effects on particular organs of the body. But we are not to suppose that an all-wise Creator, in his infinite goodness, has fitted up this world of beauty and variety, as one vast drug-shop, for the relief of human sufferings, and for the mitigation of those diseases that men bring on themselves, by the violation of the very laws by which He has ordained they shall maintain their existence. Disease is an unnatural condition, and no natural remedy exists in the wide world for its relief. Medicines, so far as is known, relieve disease by exciting in the affected organ a new or a different action; or, as some would explain it, medicine cures disease by substituting a disease of its own, which nature can then cure for herself. Whatever the *modus operandi* of medicines may be, they unquestionably produce their effects by increasing or diminishing the natural action of the organ subject to their influence. Medicines may, therefore, be regarded as always interfering, in some degree, with the natural process of vital action; and they can never be said to be harmless, unless they are wholly inert. Medicines and disease are alike evils in the animal economy. When disease actually exists, we regard the effects of medicine as the least of the two evils, and use it accordingly. For instance, in jaundice, from inactivity of the liver, there is an excessive accumulation of carbonaceous matter in the system; the blood is rendered turbid by its presence, and allows the carbon to remain in the coats of

the skin in such quantities as to color the whole surface. To procure relief from this disease, medicines are used which excite an increased secretion of bile by the liver, and which stimulate the bowels to increased action, in order to carry off the bile poured into the duodenum. By ✓ this process, the liver and bowels may become, in a certain sense, worn out, just as a piece of machinery is worn out by being propelled beyond its usual velocity.

The true way of preserving health, is not by even a judicious use of such medicines as may cure all the diseases our imprudence may create, but in so living as *to avoid the disease*, and so escape the necessity for the medicine. Some medicines, however, contain such ingredients as furnish certain elements of the blood, and may therefore be regarded as nutritive agents, since they actually contribute materials for the renovation and growth of the tissues. But most of the medicines in popular use are such as stimulate and excite some of the organs. Cathartics, laxatives, and all the so-called purifiers of the blood, have a tendency to weaken the natural tone of the organs, and their use creates more or less necessity for their repetition. Nearly all the patent medicines, that promise a cure for every ailment which affects mankind, are composed of substances possessing properties more or less cathartic; and it is worthy of note, that almost all their proprietors advise a continued use—another box, or another bottle—with a discount to such as purchase by the dozen. Nor is this all; a kind of competition has sprung up, for selling the largest quantity of these mixtures for the smallest sum of money, just as though the degree of health was to be measured by the amount swallowed in a given time. Instead of a few ounces, for occasional use, medicine is now sold by the quart, as a kind of daily beverage. The Americans and English are said to excel all other nations in the consumption of medicine; and it is equally notorious, that dyspepsia is more prevalent in England and America than in any other countries. It is

also true, so far as our own observation extends, that those families and communities which consume most of these popular panaceas, are most sickly, and furnish employment for the largest number of physicians. One reason for this may be, that those persons who are constantly supplied with pills and elixirs, allow themselves greater liberty of indulgence, since a remedy for all evil consequences is at hand. The habitual use of medicine, except for special reasons, is highly injurious to the human system. In slow chronic diseases, a long-protracted use of remedies is indispensable to recovery, but the habit of medicine-taking, even then, is a bad one, and is to be endured only because of its necessity.

It is a proverb, that "a physician will not take his own prescriptions." The truth of this is liable to some exceptions, though there are probably none who use so little medicine for themselves, or their families, as physicians. Yet no class of persons are subjected to more vicissitudes of exposure and fatigue, or whose business-habits are more unfavorable to health. Instead of resorting to medicine for every slight ailment, judicious physicians practice self-denial in regard to the indulgence of appetite, and use with more diligence the ordinary means of promoting health. The use of medicine, however, cannot always be avoided. When disease has made an attack on a vital organ, its progress must be checked, and the organ relieved by remedial agents; but the time when medicine is to be used, as well as the selection of the appropriate agent, is of more importance than most men seem to suppose. When there is a little anxiety or alarm, ignorance is ready to make use of any thing, or every thing that can be thought of, and dissatisfaction is often expressed if there should chance to be any possible means untried, while wisdom dictates a reliance upon a few remedies, or a single well-established one.

It is a general rule that no person is competent to be his own medical adviser. Even the experience and proverbial coolness of the physician, do not fit him to comprehend his own case, when under the influence of serious

disease. The members of the *American Medical Association* have therefore adopted the following rule: "All practitioners of medicine, their wives, and their children while under the paternal care, are entitled to the gratuitous services of any one or more of the faculty residing near them, whose assistance may be desired. A physician afflicted with disease is usually an incompetent judge of his own case: and the natural anxiety which he experiences at the sickness of a wife, a child, or any one who by the ties of consanguinity is rendered peculiarly dear to him, tends to obscure his judgment, and produce timidity and irresolution in his practice. Under such circumstances, medical men are peculiarly dependent on each other; and kind offices and professional aid should always be cheerfully and gratuitously afforded." If physicians cannot safely prescribe for themselves, how much less competent are those who are ignorant of the properties and powers of medicine, and who know but little, if any thing, of their own organization or of the symptoms of disease? The feelings of all men have such an influence over their bodies, that very few persons can judge correctly of their own symptoms. If you attempt to count your own pulse with any degree of anxiety, it will immediately become more frequent. One who is naturally desponding, will think himself much more dangerously ill than he really is; while another, who is full of hope and ambition, will overlook a very serious illness as of little consequence. Besides, the habit of thinking about and studying our own symptoms and feelings is, in itself, injurious; for most persons are so constituted, that when the mind is turned to the investigation of their own pains and ills, the latter assume new strength and frequency, and an illness otherwise comparatively mild becomes grave and formidable.

PHYSICIANS.

When we are so unfortunate as to become the victims of disease, the part of wisdom is to call in the aid of

superior skill and experience. It is not, however, the author's purpose to recommend the employment of a physician on account of his personal interest in the profession, but because of an honest conviction that much suffering would be saved thereby, and no small amount of medicine-taking avoided, while disease would be more judiciously treated in its incipient stages, and often prevented. In the practice of self-prescribing, men as often hit wrong as right, and as often aggravate disease as relieve it. If the whole business of administering medicine was entrusted to intelligent and faithful physicians, the demand for physicians would undoubtedly be less than under the present system of self-prescribing, and a vast amount of trifling with health and life would be avoided. The wisest course therefore, in case of sickness, is either to send for a physician at once, or to adopt a plain, unstimulating diet, with relaxation from accustomed labors, and a rigid observance of those natural means which promote health. Bathing, an abstemious diet, and, for the sedentary, gentle exercise, will often restore the tone and vigor of the various organs without the interference of a foreign agent. When these natural means fail of restoring the health, and when the invasion of disease is sudden and severe, a physician should be called without delay. Under any ordinary circumstances, medicine should not be administered, except by a person who is thoroughly versed in the symptoms of disease, the wants of the human system, and the properties of medicinal agents. None but an educated man, who is familiar with the laws of health, the philosophy of disease, and the administration of medicine, is competent to assume this responsible trust.

In making choice of a physician, you are to judge of the comparative merits of different practitioners by the same rules that you apply to other men. The architect, the artist, the mechanic, or the farmer, who give evidence of the greatest intelligence in their respective callings, are most successful and most worthy of confidence. A phys-

ician, to be worthy of having committed to his watch and care the health and lives of his fellow-men, should be a man of learning and reflection, and a thorough student in his profession. Though mere learning or book-knowledge will not avail to constitute a skillful physician, unless there be superadded that practical common sense which enables its possessor to conform to whatever circumstances he may be placed in, and adapt his remedies to the peculiarities of each case he may be called to treat. The mass of men, however, know so little of their own organization, or of the phenomena of disease, that they have but limited means of forming a correct opinion of the comparative merits of different practitioners from what they see and hear of their practice; for it often happens that an unworthy pretender will make more show of learned words, and more talk of wonderful cures, than a well-educated man, who is laden with the carefully gathered experience of years. It will generally be found that those men who make a parade of their knowledge or of their skill have but a limited supply of either, and are mere pedlers, who display their wares at every door. Quacks there are, both in and out of the regular profession, whose great study is not man or mankind, but how to make themselves most admired and sought after. Such men usually claim to have discovered some new and better way—some new specific or some new remedy—or to possess a skill not enjoyed by other men. For the most part, the men of one great idea in medicine have never passed the threshold of knowledge, and are total strangers to the hidden treasures of science, which lie beneath the superficial world in which they are so proud to display themselves. Men of true intelligence have nobler themes of thought than self, and a higher calling than self-aggrandizement. Such men, though they may justly be styled "*learned*," when compared with others, have only reached that high point of intelligence where they can perceive so much that is yet to be learned, that they are constrained to be modest observers

of nature and patient students; while fools, self-confident and boastful, rush headlong. Select, therefore, for your medical adviser a man who possesses common sense, and is studious and thoughtful—not ostentatious or self-confident.

The great study of the true physician is not to display to the best possible advantage his magazine of medicines in a conflict with disease, but to follow nature in her efforts to restore the equilibrium of health. The better class of regular physicians of the present day are giving less and less medicine, and relying more and more on the natural means of promoting health. Judicious advice, in regard to habits of diet, bathing, exercise and rest, is frequently all that the patient requires. You may therefore rest assured that there is no occasion for anxiety or dissatisfaction if your physician should presume to make his visit, charge his fee, and depart without leaving a single pill, powder, or particle of medicine to be taken; for that practitioner who leaves his patient to nature, often exercises higher wisdom than the man who makes a liberal display of medicine; though there are circumstances in which prompt, energetic measures are imperatively demanded, and where liberal doses of medicine are indispensable to the relief of the patient. Hence, the physician is always to be the judge as to what treatment is best. If he is a man of only ordinary powers, he ought to know much better than the patient or his friends what the case requires. How can the physician, who has made the phenomena of disease the great study of his life, fail to know more about it than a whole neighborhood of friends, who, at best, have only a very few crude notions on the subject, and whose judgment in the case is by no means more reliable for the anxiety they entertain?

It is, however, of the first importance that the patient and friends should put the physician in immediate possession of all the facts having a direct bearing on the case. All foreign topics of conversation should be studiously avoided, unless introduced by the physician himself. Many

men are so constituted that they will seldom examine a patient thoroughly when their minds are diverted by other matters. If your physician be a studious and an industrious man, worthy of your confidence, he cannot afford to spend an extra half hour even in agreeable conversation, when other patients require his attention, or when he ought to be in his office, furnishing his mind for the special duties of his profession. Still, it is by no means improper for a physician to be social and affable with his patients. Under some circumstances, a pleasant word, a cheerful countenance, or an amusing anecdote, may prove the very best medicine that can be administered to the patient. And the directions for the administration of medicines, and the general care of the patient, should be clearly understood and faithfully executed. The physician should always be left free to choose his own remedies and the mode of their administration, unless the patient's experience should suggest some modification, which may be freely and frankly communicated, and the course to be pursued be then left to his discretion. The principles which govern the most respectable portion of the medical faculty in their intercourse with their patients, may be learned from the following extracts from the "*Code of Medical Ethics*," adopted by the *National Medical Convention*, in 1847:

ART. I.—*Duties of Physicians to their Patients.*

¶ 1. A physician should not only be ever ready to obey the calls of the sick, but his mind ought also to be imbued with the greatness of his mission, and the responsibility he habitually incurs in its discharge. Those obligations are the more deep and enduring, because there is no tribunal, other than his own conscience, to adjudge penalties for carelessness or neglect. Physicians should, therefore, minister to the sick with due impressions of the importance of their office; reflecting that the ease, the health, and the lives of those committed to their charge, depend on their skill, attention and fidelity. They should study, also, in their deportment, so to unite *tenderness* with *firmness*, and *condescension* with *authority*, as to inspire the minds of their patients with gratitude, respect and confidence.

¶ 2. Every case committed to the charge of a physician should be

treated with attention, steadiness and humanity. Reasonable indulgence should be granted to the mental imbecility and caprices of the sick. Secrecy and delicacy, when required by peculiar circumstances, should be strictly observed; and the familiar and confidential intercourse to which physicians are admitted in their professional visits, should be used with discretion, and with the most scrupulous regard to fidelity and honor. The obligation of secrecy extends beyond the period of professional services;—none of the privacies of personal and domestic life, no infirmity of disposition or flaw of character observed during professional attendance, should ever be divulged by him except when he is imperatively required to do so. The force and necessity of this obligation are indeed so great, that professional men have, under certain circumstances, been protected in their observance of secrecy, by courts of justice.

§ 3. Frequent visits to the sick are in general requisite, since they enable the physician to arrive at a more perfect knowledge of the disease,—to meet promptly every change that may occur, and also tend to preserve the confidence of the patient. But unnecessary visits are to be avoided, as they give useless anxiety to the patient, tend to diminish the authority of the physician, and render him liable to be suspected of interested motives.

§ 4. A physician should not be forward to make gloomy prognostications, because they savor of empiricism, by magnifying the importance of his services in the treatment or cure of the disease. But he should not fail, on proper occasions, to give to the friends of the patient timely notice of danger, when it really occurs; and even to the patient himself, if absolutely necessary. This office, however, is so peculiarly alarming when executed by him, that it ought to be declined whenever it can be assigned to any other person of sufficient judgment and delicacy. For, the physician should be the minister of hope and comfort to the sick; that, by such cordials to the drooping spirit, he may smooth the bed of death, revive expiring life, and counteract the depressing influence of those maladies which often disturb the tranquillity of the most resigned, in their last moments. The life of a sick person can be shortened not only by the acts, but also by the words or the manner of a physician. It is, therefore, a sacred duty to guard himself carefully in this respect, and to avoid all things which have a tendency to discourage the patient and to depress his spirits.

§ 5. A physician ought not to abandon a patient because the case is deemed incurable; for his attendance may continue to be highly useful to the patient, and comforting to the relatives around him, even in the last period of a fatal malady, by alleviating pain and other symptoms, and by soothing mental anguish. To decline attendance, under such circumstances, would be sacrificing to fanciful delicacy and mistaken

liberality, that moral duty, which is independent of, and far superior to all pecuniary consideration.

§ 6. Consultations should be promoted in difficult or protracted cases, as they give rise to confidence, energy, and more enlarged views in practice.

§ 7. The opportunity which a physician not unfrequently enjoys of promoting and strengthening the good resolutions of his patients, suffering under the consequences of vicious conduct, ought never to be neglected. His counsels or even remonstrances, will give satisfaction, not offence, if they be proffered with politeness and evince a genuine love of virtue, accompanied by a sincere interest in the welfare of the person to whom they are addressed.

ART. II.—*Obligations of Patients to their Physicians.*

§ 1. The members of the medical profession, upon whom are enjoined the performance of so many important and arduous duties towards the community, and who are required to make so many sacrifices to comfort, ease, and health, for the welfare of those who avail themselves of their services, certainly have a right to expect and require, that their patients should entertain a just sense of the duties which they owe to their medical attendants.

§ 2. The first duty of a patient is, to select as his medical adviser one who has received a regular professional education. In no trade or occupation, do mankind rely on the skill of an untaught artist; and in medicine, confessedly the most difficult and intricate of the sciences, the world ought not to suppose that knowledge is intuitive.

§ 3. Patients should prefer a physician whose habits of life are regular, and who is not devoted to company, pleasure, or to any pursuit incompatible with his professional obligations. A patient should, also, confide the care of himself and family, as much as possible, to one physician; for a medical man who has become acquainted with the peculiarities of constitution, habits, and predispositions, of those he attends, is more likely to be successful in his treatment, than one who does not possess that knowledge.

A patient who has thus selected his physician, should always apply for advice in what may appear to him trivial cases, for the most fatal results often supervene on the slightest accidents. It is of still more importance that he should apply for assistance in the forming stage of violent diseases; it is to a neglect of this precept that medicine owes much of the uncertainty and imperfection with which it has been reproached.

§ 4. Patients should faithfully and unreservedly communicate to their physician the supposed cause of their disease. This is the more important, as many diseases of a mental origin stimulate those depending on

external causes, and yet are only to be cured by ministering to the mind diseased. A patient should never be afraid of thus making his physician his friend and adviser; he should always bear in mind that a medical man is under the strongest obligations of secrecy. Even the female sex should never allow feelings of shame or delicacy to prevent their disclosing the seat, symptoms and causes of complaints peculiar to them. However commendable a modest reserve may be in the common occurrences of life, its strict observance in medicine is often attended with the most serious consequences, and a patient may sink under a painful and loathsome disease, which might have been readily prevented had timely intimation been given to the physician.

§ 5. A patient should never weary his physician with a tedious detail of events or matters not appertaining to his disease. Even as relates to his actual symptoms, he will convey much more real information by giving clear answers to interrogatories, than by the most minute account of his own framing. Neither should he obtrude the details of his business nor the history of his family concerns.

§ 6. The obedience of a patient to the prescriptions of his physician should be prompt and implicit. He should never permit his own crude opinions as to their fitness, to influence his attention to them. A failure in one particular may render an otherwise judicious treatment dangerous, and even fatal. This remark is equally applicable to diet, drink, and exercise. As patients become convalescent they are very apt to suppose that the rules prescribed for them may be disregarded, and the consequence, but too often, is a relapse. Patients should never allow themselves to be persuaded to take any medicine whatever, that may be recommended to them by the self-constituted doctors and doctresses, who are so frequently met with, and who pretend to possess infallible remedies for the cure of every disease. However simple some of their prescriptions may appear to be, it often happens that they are productive of much mischief, and in all cases they are injurious, by contravening the plan of treatment adopted by the physician.

§ 7. A patient should, if possible, avoid even the *friendly visits* of a physician who is not attending him—and when he does receive them, he should never converse on the subject of his disease, as an observation may be made, without any intention of interference, which may destroy his confidence in the course he is pursuing, and induce him to neglect the directions prescribed to him. A patient should never send for a consulting physician without the express consent of his own medical attendant. It is of great importance that physicians should act in concert; for, although their modes of treatment may be attended with equal success, when employed singly, yet conjointly they are very likely to be productive of disastrous results.

§ 8. When a patient wishes to dismiss his physician, justice and common courtesy require that he should declare his reasons for so doing.

§ 9. Patients should always, when practicable, send for their physician in the morning, before his usual hour of going out; for, by being early aware of the visits he has to pay during the day, the physician is able to apportion his time in such a manner as to prevent an interference of engagements. Patients should also avoid calling on their medical adviser unnecessarily during the hours devoted to meals or sleep. They should always be in readiness to receive the visits of their physician, as the detention of a few minutes is often of serious inconvenience to him.

§ 10. A patient should, after his recovery, entertain a just and enduring sense of the value of the services rendered him by his physician; for these are of such a character, that no mere pecuniary acknowledgment can repay or cancel them.

MANAGEMENT OF THE SICK.

The domestic management and care of the sick is not less important than good medical advice. The prescriptions for the sick may be ever so timely and judicious, and yet prove wholly worthless to the patient, from want of attention to their execution, or from improper management in other matters pertaining to the patient's welfare. As a general rule, the directions for the administration of medicine should be rigidly followed, since the attendants can rarely know the design of the physician, or the effects which might be expected to result from his prescriptions. But the proper administration of medicine, though in itself highly important, constitutes but a small part of the duties of the sick-room: The comfort and convenience of the apartment, and the management and conduct of the friends and attendants, all have an influence on the patient, and may operate for or against his recovery. In nearly all diseases, the mental state of the sick has more or less influence on disease. If the patient is harassed and annoyed by too much company, by conversation, or by noise and confusion, his chance of recovery will be diminished. The friends should always be cheerful and happy in the presence of the patient. Hope is a needful anchor to the sick: when this is taken away, the body often sinks rapidly un-

der the progress of disease; for medicine has but little power to raise that man whom despair is drawing down. The author has repeatedly seen patients who have entertained the impression that they are not to recover, gradually sink away, and go down to death, when apparently the disease was not of such a nature as to preclude expectation of recovery under other circumstances. While we should not permit our friends to go to the spirit-land unwarned, we should be careful not to sound the death-knell to them by our own desponding words or even looks. It is therefore the duty of friends, whatever their apprehensions, to be composed and cheerful in the presence of the sick, unless there is an absolute certainty that recovery is impossible. Kindness and affection, and a disposition to anticipate their every want, are also of great value to the sick in relief from anxiety, and in producing that calm, tranquil state of mind, which is the best possible condition for restoration to health.

A very important matter, and one often overlooked, is cleanliness of the person, clothes, and apartment of the patient. The patient should be washed all over each day, and his clothes changed throughout. The importance of personal cleanliness of the sick cannot be over-estimated. Its benefits are not confined to the sick alone; the health of the attendants will be much less likely to be impaired; while the chances of recovery to the sick will certainly be increased. In nearly all diseases, the exhalations and excretions from the person of the patient are highly injurious, if not absolutely poisonous. The accumulation of these impure matters on the clothes and on the surface cannot fail to be deleterious to the patient himself, and to render him unwholesome to his attendants.

A thorough ventilation of the sick-room is also of very great importance. Many of the most malignant epidemics have their origin in an impure atmosphere, and spread from one member of a family to another, and from house to house. The poison which induces the disease, not only

exists in the atmosphere of particular localities, but is constantly emanating from the victims of the disease. One of the most common causes of typhus fever, is the breathing of the effete matters of the human body. Prisons and emigrant-ships thus often prove to be the very hot-beds of this malignant fever. Of the one hundred thousand emigrants who left the British isles for Canada in 1847, over five hundred perished on the passage. From some ships, upwards of one hundred were buried at sea. The great mortality on board these ships was caused unquestionably by breathing over and over again the air which had become impure and poisonous, from the crowding together of a large number of human beings in the close holds of the emigrant-ships. In health, there are from thirty to forty ounces of impure matter thrown off from the skin and lungs daily. In sickness, the amount is often greater, besides containing the poisonous emanations from diseased tissues. When we consider how little attention is paid to the ventilation of sick-rooms by most families, it is no matter of wonder that scarlatina, dysentery, and typhus fever should spread from one member of a family to another, where they have been living in an atmosphere loaded with the poisonous exhalations which are necessarily evolved by these diseases. Persons in full health, who have passed only a night in watching, often return in the morning with a furred tongue and a loss of appetite, caused no doubt by the impure air they have inhaled during only a single night. What, then, must be the effect of such air on the unfortunate patient, who must live in it day after day, or the attendants, who must inhale it the greater portion of the time? If the recovery of the sick or the health of attendants be a desirable object, the importance of a thorough ventilation of the sick-room cannot be over-estimated. An airing once or twice a-day is not sufficient. There should be a constant exchange of air night and day —the impure air all the while passing out and pure air coming in.

Pure air in the sick-room is always of primary importance, and no fumigation by aromatics or disinfecting agents can be admitted as a substitute for ventilation. In eruptive and infectious diseases, in typhus fever, in malignant disorders, in ill-conditioned sores and ulcers, more than ordinary care and watchfulness will be required to keep the air of the room in a healthy condition. Under such circumstances, some advantage may be derived from disinfectants. The best disinfectant is chlorine in some form. Chloride of lime and chloride of soda are both efficient disinfectants, and one of these agents should be in use whenever the disease is of a malignant or putrid character. The chloride of lime should be mixed with water, in the proportion of one of lime to forty of water, and placed in a flat dish or plate, so as to expose a large surface to the action of the air. The chloride of soda may be exposed on wet cloths in an open dish. Pastiles and most of the aromatic odors in common use for fumigations are worse than useless. They only serve to produce an agreeable impression on the sense of smell, while the air is at least as impure as before.

The sick-room should always be made as comfortable and as pleasant as possible, though it often requires much care and a good degree of intelligence to make it so. Most persons in sickness are extremely sensitive to all those circumstances which can affect in any degree the senses. The temperature of the room should be as uniform as possible, and should be at that point which is most agreeable to the feelings, and this will generally be found to be about sixty degrees (Faht.) The amount of light should also be regulated according to the feelings of the patient. When there is any tendency to disease of the brain, too much light will prove a source of irritation, and aggravate the disease. If the room is too dark, the impression on the spirits of the patient may be unfavorable, or he may be fatigued by efforts to see without sufficient light.

All unnecessary noise and bustle should be scrupulously

avoided in the sick-room. It should therefore contain only those articles which are indispensable to the comfort of the patient. All useless furniture should be removed, as it necessarily requires additional labor to keep it in place and in order. The period chosen for cleaning and arranging the room should be the morning, as the patient is always better able to bear a little noise and bustle after a night's rest. The carpet should be sprinkled with moist tea leaves, to prevent dust, and swept lightly, and the room put in order as quietly as possible. When circumstances will admit of it, the medicines and drinks of the patient should be kept in an adjoining room. It is often quite enough for the patient to take medicine when presented, without being compelled to have it constantly before him, as an ever-present object of dislike and dread.

Visitors should not be admitted, except with the advice and approbation of the attending physician. When the physical and intellectual powers are enfeebled by disease, the sick are fatigued and injured by conversation, by mental excitement, or by the presence of visitors, much more easily than most persons seem to suppose. In critical cases, where there is a fearful balancing between recovery and dissolution, a single call may turn the scale of life. The fact that a visitor is an esteemed friend is by no means a reason for his admission; for patients often exert themselves during the presence of visitors in proportion to the pleasure with which they are received or the esteem in which they are held. There is, however, an art in approaching the sick, which is of great value. First of all, preserve the most perfect self-possession; be cheerful and hopeful in deportment and expression.

“Go seek the dismal chamber, where disease
Reclines with wasted form and pallid hue;
Where through the half-closed shutter sadly creeps
A feeble ray that scarce a twilight sheds:
Whilst all around distressing signs appear
Of fruitless remedies! Mark, then, how sweet

'To lift the eye of Hope upon a friend!
To feel upon the fluttering pulse the grasp
Of one beloved—it beats with firmer force—
The languid eye beams momentary joy;
And sickness, cheated by the smiling scene,
Awhile forgets her pain-inflicting task!"

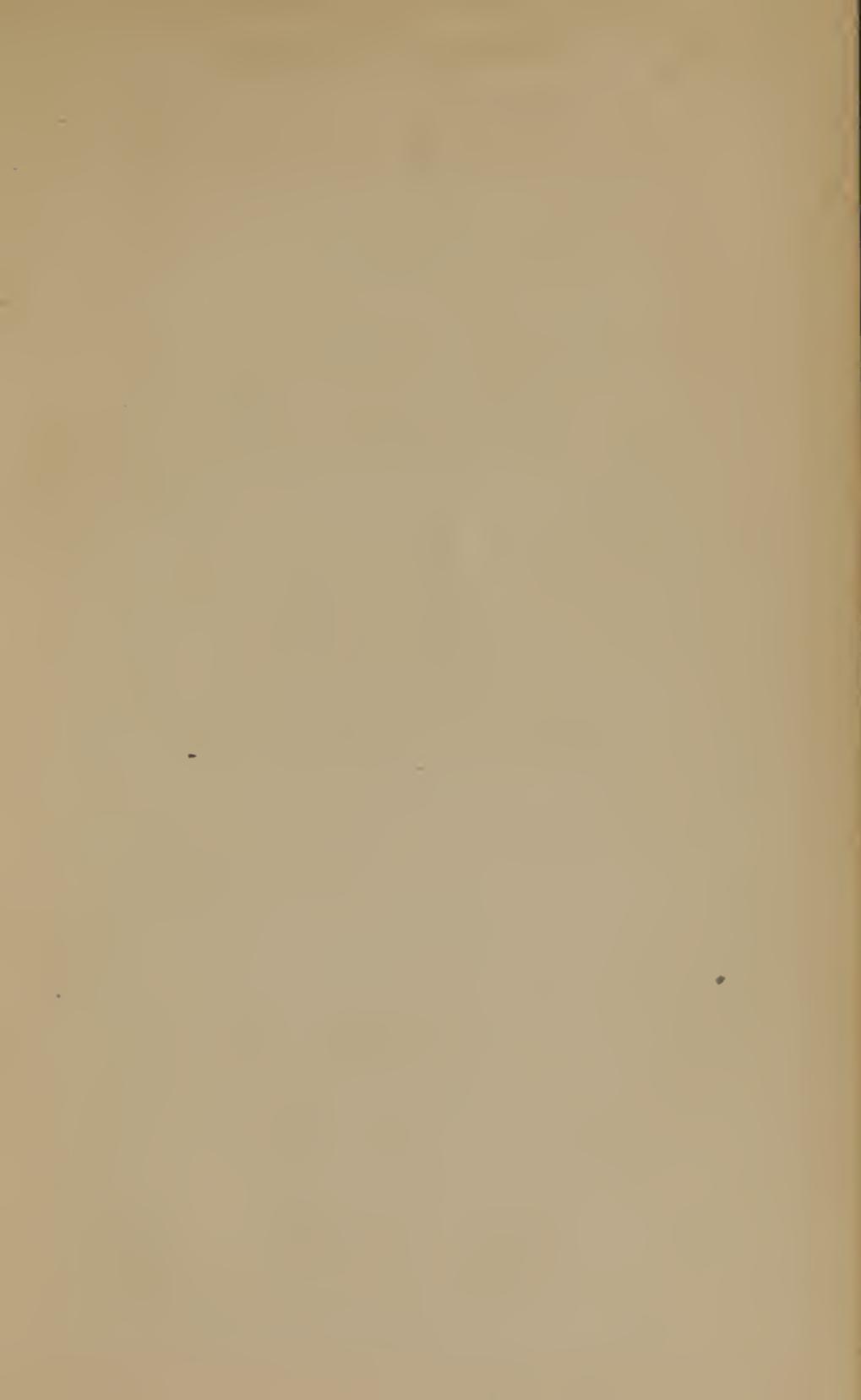
Nothing is more pernicious to the sick than to perceive in their friends evidence of anxiety and fear. Those who are prostrated with disease, and debilitated in body and mind, very naturally look to their friends for encouragement and support; but when they meet with discouraging words and desponding looks, hope departs, and life's taper soon goes out. No suspicions should therefore be raised in the mind of the sick that the disease is not progressing favorably. All whisperings, consultations, exchanging expressive looks—all expressions of commiseration in his condition, and all remarks of surprise at finding him so sick, should be carefully avoided. If the disease is actually progressing unfavorably, and the patient growing worse, it will only aggravate the unfavorable symptoms to put him in possession of the true state of the case. But when the patient voluntarily insists upon knowing the true prospects of his case, the truth is not to be sacrificed, though it should be tempered with consolation and hope.

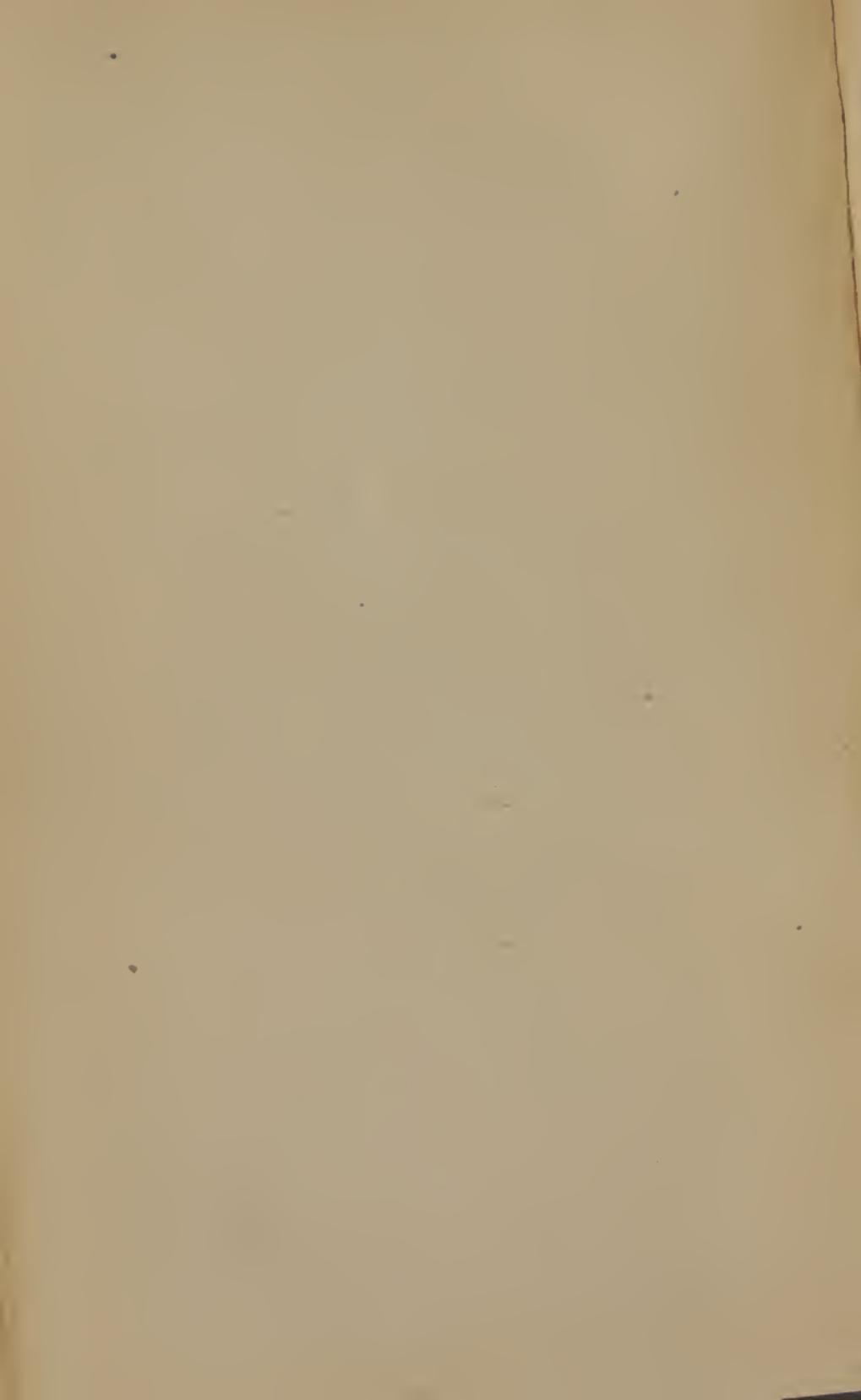
The consolations of religion are of inestimable value as a support to the mind when bodily strength fails. The Christian's hope tranquillizes the mind, ealms all anxieties in regard to the future, and imparts to the trembling invalid that full resignation in the Divine will, which furnishes a mental state in the highest degree favorable to recovery. For the strongest motive which can inspire man to triumph over pain and difficulty, is that internal evidence of the Divine approval which flows from an earnest faith in Christ. But the truths of Christianity must be presented to the feeble and over-susceptible mind with very great prudence and discretion. The promises of the Gospel and the love of Christ are the appropriate themes to cheer and

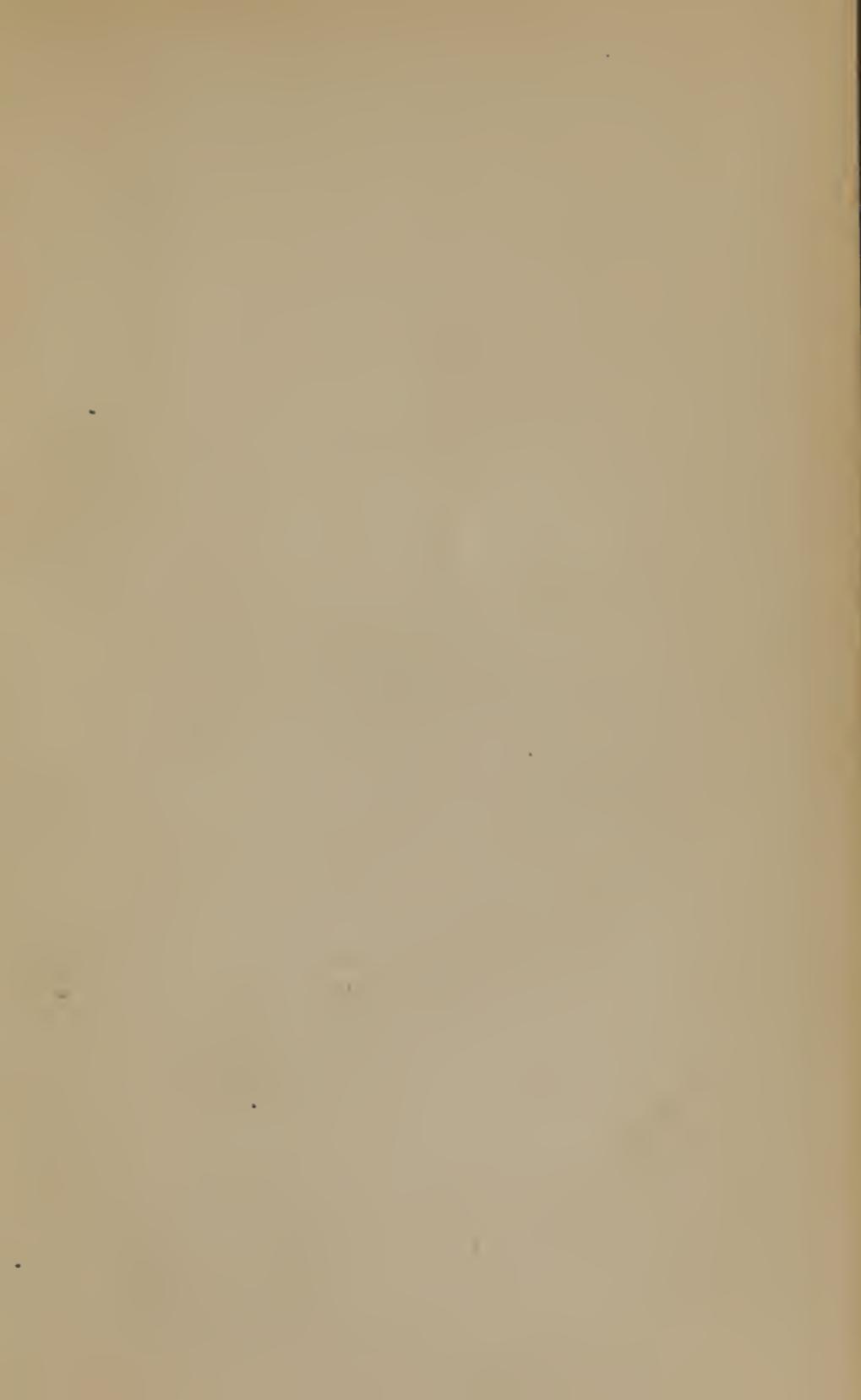
comfort him who is ready to perish. The object should be to soothe and calm the feelings—not to distract and alarm. On the bed of sickness, the spirit is subdued and the heart softened; and as the mind becomes conscious of its helplessness, it is almost invariably turned to the contemplation of a future state of existence. Even the infidel, who in health obstinately refused all allegiance to a Superior Being, in the restless wakefulness of successive nights of bodily suffering, looks up to that same Being, when he finds all human power has failed him. Therefore, when thy friend draws nigh unto death, cheer him with the consolations and hopes of the Christian religion; and

“So live, that when thy summons comes to join
The innumerable caravan that moves
To that mysterious realm, where each shall take
His chamber in the silent halls of death,
Thou go not, like the quarry-slave at night,
Scourged to his dungeon; but, sustained and soothed
By an unfaltering trust, approach thy grave,
Like one that draws the drapery of his couch
About him, and lies down to pleasant dreams.”

THE END.







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